

# SUPPLEMENT.

## The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

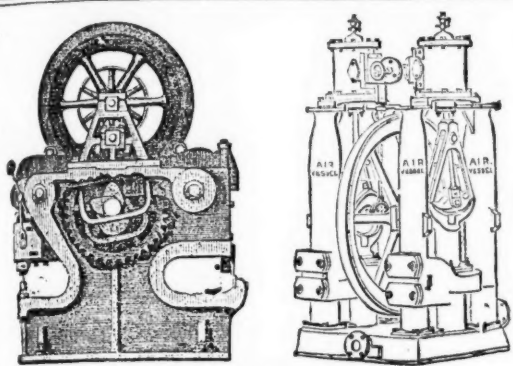
FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2032.—Vol. XLIV.

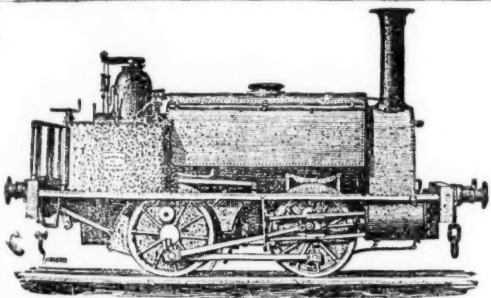
LONDON, SATURDAY, AUGUST 1, 1874.

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TION," in Dublin, 1865; at the "UNIVERSAL EXHIBITION," in Paris, 1867;  
at the "GREAT INDUSTRIAL EXHIBITION," at Altona, in 1869; and at the  
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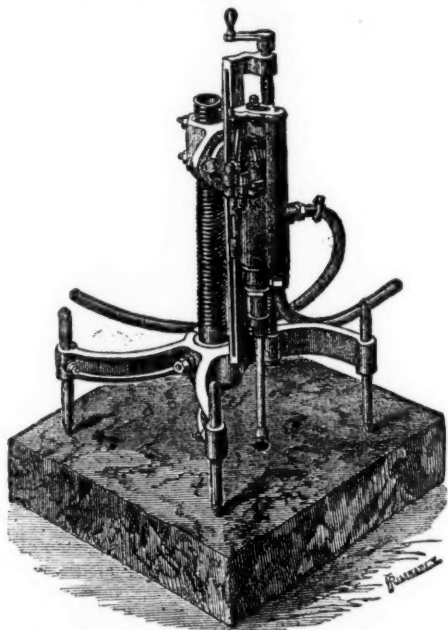
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Paris, 24th April,  
L'Administrateur Délégué,  
(Signed) A. CHAMPOUILLON.

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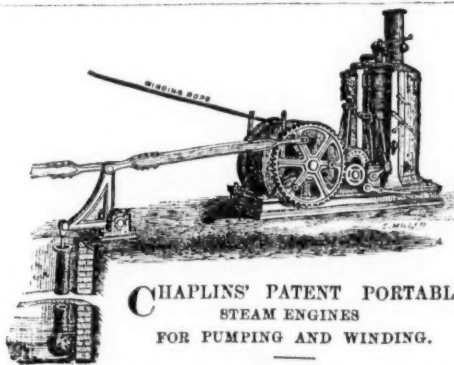
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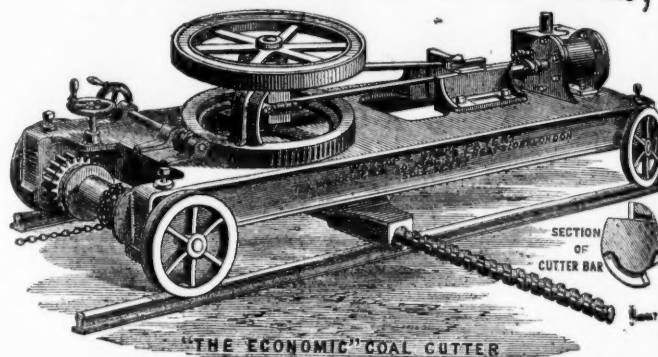
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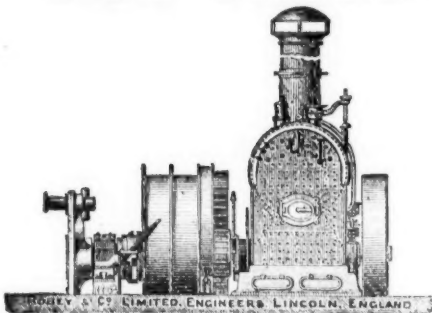
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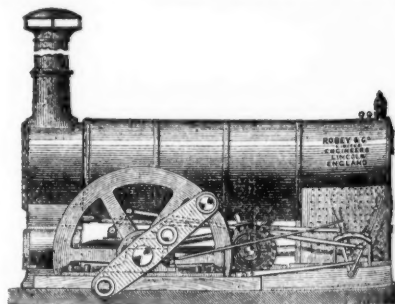
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**SPARGO'S ANNUAL STATISTICS AND OBSERVATIONS ON  
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The work will contain particulars of all the important mines in the counties  
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To secure an early copy subscribers are requested to forward their application as  
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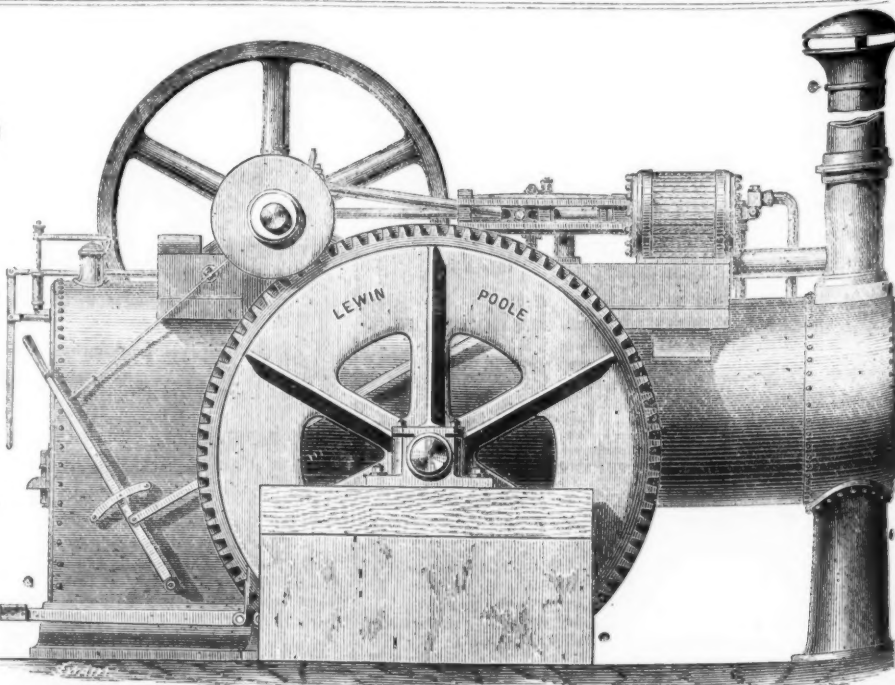
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## Original Correspondence.

## THE DUKINFELD EXPLOSION.

SIR,—Your contemporary, the *Colliery Guardian*, had a very sensible article last week, commenting upon the Report of Her Majesty's Inspector of Mines, Mr. Wynne, on this explosion, from which the writer deduces that even if one Government Inspector were appointed over every twenty collieries such as Dukinfield is, that explosions like that which has just been investigated would occur. He might have added that the Inspector in this instance is one of the oldest and most experienced of the corps, and one who is well known for his assiduity and attention to his duties. He also very properly argues that it would be quite out of the question for Government to do anything of the kind, and he might have added, that if they did it would not lessen accidents.

Explosions of fire-damp happen from something unexpected occurring, whereby the ordinary arrangements for ventilating the mine are unequal to the emergency. In Dukinfield, part of the mine appeared to have been lighted with gauze, or safety, lamps, and part with naked lights, or lights not covered with gauze; the former in those parts where gas might occur, the latter where it was thought gas was not likely to be found. The ventilation was so good that, although the Inspector thought it stunted, yet he felt that an arbitrator might have had a different opinion, and under this arrangement it continued to work for years, until the "something unexpected" came. If the theory of the cause of explosion be correct, this "something unexpected" was a fall of roof at the point where naked lights were used, and where there was an unexpected accumulation of gas. This gas came upon the naked lights, exploded, and caused the accident. Had danger from an accumulation of gas been suspected, safety-lamps, and not naked lights, would have been there. Had there been safety-lamps there would have been no explosion.

With all deference, therefore, to the Inspector, the explosion was not caused by want of a sufficient ventilation, but for want of safety-lamps. For, if the accumulation of gas existed in the position suggested by the scientific gentlemen, if the general ventilation had been ten times greater it would not have prevented the ignition of the gas upon a naked lamp. I venture to state that 99 per cent. of all explosions occur by the gas exploding at a naked light, or from blasting where safety-lamps are used, and that if naked lights were prohibited, and only safety-lamps used, in all mines where fire-damp had been seen during the preceding twelve months, and no blasting under any circumstances allowed, it would prevent very many explosions, because they would only occur through neglecting to keep the safety-lamps in proper trim. The use of safety-lamps would put 2s. to 4d. per ton on the cost of coal, and the want of gunpowder other 4d. to 8d. per ton.

Anyone acquainted with mining has only calmly to think over his experience, and look to the record of past explosions, to see that what I have stated is correct, and that nothing short of the measures stated, and proper discipline, will lessen these casualties. I used to think that the use of safety-lamps tended to the neglect of ventilation, as the same care was not taken to carry the air forward, nor was the same quantity of air sent into the mine when the safety-lamp was there to fall back upon. I do not think this is so now. I believe the mines would be equally well ventilated, and I also firmly believe that invention would be stimulated, and we should get some non-expensive light. Be that as it may, I am satisfied that if we want to reduce the accidents from explosions to a minimum we must prohibit the use of all lights other than safety-lamps, and prohibit the use of gunpowder in mines where gas is known or suspected to exist.

AN ENGINEER.

## COAL-CUTTING MACHINERY—PRIZE COMPETITION.

SIR,—In the article in the *Journal* of last Saturday, headed "Coal-Cutting Machinery—Prize Competition," the writer says, speaking of the Economic Coal-Cutter, "It went smoothly along, doing good work, although the machine does not appear to cut from the bottom of the ground, owing to not being able to gear the cutter-bar." I am not quite clear as to the meaning of the remark, but apparently the writer is under a misapprehension, as the Economic Coal-Cutter undercuts the coal as near the ground as any other—viz., just above the rails, and moreover, in the machine at Haddington, the cutter-bar was geared.

By kindly inserting this letter in next week's *Journal* you will correct what might lead to an erroneous impression of the machine.

King-street, Cheapside, July 28. THOS. A. WARRINGTON.

## COAL FOR BIRMINGHAM.

SIR,—A few days ago we had the good news of the discovery of coal in Sandwell Park, and in confirmation of the old adage that neither good nor bad news ever comes single, we have the satisfaction to know that the Birmingham and Blakely Hall Colliery Company (Limited) has settled the difficulty which has so long kept the company restricted in their operations to Bromford coal. And that the company is now free to drive into the 10-yard coal (under Blakely Hall Estate) from their pits now open, which will at once enable the company to produce a very large quantity per day of the finest 10-yard coal. This is good for Birmingham and the whole of the Black Country, and at the same will enable the shareholders to make such profits as will no doubt be equal to their most sanguine expectation. It is the nearest colliery to Birmingham, and the coal can no doubt be delivered into our great wharf by canal at 1s. or more per ton less cost than from collieries less favourably situated. We are told the men have commenced to make the headways into the coal.

Birmingham, July 30. INHABITANT.

## COLLIERY ACCIDENT FUNDS.

TO THE EDITOR OF THE TIMES.

SIR,—Up to the present the persons connected with the funds collected for colliery accidents remain silent. This may be wise policy; it is for their consideration alone. Only this let us say of them—they mistake us much if they expect for one moment we will now leave the subject till we have a full explanation of how every sum was expended that was placed in their hands for the great mine disasters of Lund Hill, Hartley, Oaks, Talke-o'-the-Hill, Cymmer, Risca, and all the others to which vast numbers of our fellow citizens contributed to the aid of the survivors. With this I enclose the copy of a letter I have received from the Rev. Sir L. T. Stamer, Rector of Stoke-upon-Trent, and crave that you will afford it a place. I have also a letter from one of the committee of the Oaks Fund, making a similar charge against the Mansion House authorities.

House of Commons. A. MACDONALD.

TO ALEXANDER MACDONALD, Esq., M.P., Stafford.

SIR,—Having acted as Chairman of the Finance Committee of the Talke Colliery Accident Relief Fund, I am able to give you some information on the subject. On the occurrence of the accident at Talke, on Dec. 13, 1869, a meeting was at once held at Stoke, and it was decided that an appeal should be made on behalf of the sufferers, and that its object should be extended so as to secure not only what was requisite to meet the distress arising out of this one calamity, but should be sufficient to establish a permanent fund for the relief of similar cases hereafter. It was given. Undoubtedly they were larger than they would have been had it simply been an appeal from the Mansion House for the relief of the sufferers in the Oaks and Talke explosions conjointly. It was very largely responded to. I forget the exact amount, but I believe it exceeded 20,000l. Our committee confidently relied on receiving a proportionate share of this fund; but on communication with the Mansion House authorities we were asked to furnish them with an actuary's estimate of the cost of relieving the survivors of those killed at Talke, and a return of deficiency, but no more.

I was instructed to reply that our appeal had been founded on the intention of doing much more than relieving this incidental distress, so that we could make no estimate of what we should require, our object being to get as large a sum as possible, in order to establish a permanent relief fund. The Mansion House Committee persisted in their view of the case, and it was only under strong pressure that they gave the Oaks Committee about double that sum. The balance remaining from the Mansion House contribution was very considerable. I remember it was drawn upon for the relief of the survivors of those killed at Talke, and a return of deficiency, but no more.

I agree with you that an enquiry ought to be made as to the way in which the surplus of all these funds have been dealt with.

At this moment the sum apportioned to this district from the Hartley surplus

has never been employed as intended, and there is a sum of 4000l. with interest that has yet to be accounted for. I send you reports of the Permanent Relief Fund, which we have established with the surplus of the Talke Fund, which may interest you. If I can give you any further information I shall be happy to do so.

Rev. LOYSLACK T. STAMER, Rector of Stoke-upon-Trent.

Cliffeville, Stoke-upon-Trent, July 23.

## NOVA SCOTIA GOLD FIELDS.

SIR,—Below we beg to hand you the report of crushings for June, which have been received at Halifax up to the departure of the steamer of the 14th. Oldham and Caribou, though not represented, are stated to be making satisfactory progress.

London, July 29.

## THE CANADIAN MINES BUREAU.

Winn Harbour	Mill	Quartz crushed.	Gold obtained.
Victoria	.....	27 0	5 19 10
Orient	.....	32 0	15 0 0
Elfordo	.....	65 0	9 10 0
Ditto	.....	.....	14 0 0
TANGIER	Forrest	27 0	15 5 8
Waverley	Mayflower Co.	65 0	13 0 0
McClure	.....	78 0	178 6 0
GAY'S RIVER	McDonald & Co.	250 0	40 0 0
SHERBROOKE	Union	30 10	14 16 6
Dominion	.....	105 0	51 8 0

Total ..... Tons 689 10 ... 354 5 0

## THE AUSTRALIAN TIN MINES.

SIR,—I hand herewith an account of the quantities of tin ore sent from the mines during the four weeks ending May 22; the yield seems to have fallen off but little. I do not send an account of the tin and tin ore cleared out during that time, as it does not give any estimate of the proportions of tin and ore, for large quantities of slab tin are sent to Melbourne for shipment home.

Sydney, June 5.

NEW SOUTH WALES.

## QUANTITIES OF TIN ORE SENT FROM THE AUSTRALIAN TIN MINES DURING THE FOUR WEEKS ENDING MAY 22.

		Tons c.	qr.	lbs.	Tons c.	qr.	lbs.
April 29	Via Warwick	87	10	1	5		
May 7	Ditto	102	13	2	3		
14	Ditto	70	3	2	24		
21	Ditto	84	9	24	344	10	2
April 29	Via Murrumbidgee	32	8	3	11		
May 7	Ditto	41	16	3	13		
14	Ditto	23	1	0	12		
20	Ditto	26	12	2	22	128	19
May 5	Via Grafton	30	2	0	0		
11	Ditto	2	8	0	0		
12	Ditto	26	17	0	0		
7	Ditto	18	0	0	0		
18	Ditto	55	0	0	0		
19	Ditto	5	0	0	0		
21	Ditto	19	12	0	0	156	19

Total ..... Tons 625 14 3 20

## HYDRAULIC GRAVEL MINING IN CALIFORNIA.

SIR,—Among the various mining industries of this coast which at present command the greatest attention, and in which the interests of British capitalists is largely involved, may be mentioned hydraulic gravel mining. It recommends itself to capitalists from the fact that it is at once the most economical and the most certain method of extracting the precious metal, and for this reason it has been extensively entered into in this State with most profitable results. The grand desideratum, a good payable gravel bed, having been secured, two requisites only are essentially necessary for its development—water to move the gravel, and a permanent outlet for superfluous matter or tailings. To obtain the first, ditches have been constructed at a great expense, which conduct water from the neighbouring mountains, and from the great rivers of the State and their affluents. To effect the latter, tunnels have been constructed which have cost many thousands of dollars. But when these absolute conditions have been fulfilled the question of expense is in a great measure disposed of, and the employment of moderately-paid labour, and the operation of blasting powder and the Little Giant, secure returns to the owners of the mines which could not be obtained at the same outlay from any other mining enterprise. Your correspondent was led to these conclusions from a visit which he recently made to the well-known gravel mines of Sucker and Mooney Flats, and Smartsville, a district of country lying around the ancient débouchure of the Yuba River, in the Sacramento Valley. The Yuba is one of the principal affluents of the Sacramento, on the west side of the Sierra Nevada range of mountains, and into this river the washings of the mines above it are conveyed. Here hydraulic mining has been carried to great perfection for some years past, as is clearly indicated by the large tracts of ground that have been swept away. In one place you see a mountain cut in half, or separated from its connecting range, standing out in solitary grandeur, but only for a time. Heavy blasts of powder, consisting of from 300 to 700 barrels at a time, will soon reduce its dimensions, and level it with the plain: 200 ft. below the miners have pierced the auriferous gravel of the ancient river, and this they wash with a powerful engine, the Little Giant, which impels a volume of 400 or 600 in. of water under a heavy pressure against the surrounding banks. The State Geological Survey has determined the age of these ancient rivers, which deposit the gravel, to be of the Pliocene Tertiary. Pliocene canyons are ancient treasure chests, having been filled in the course of ages by fluvial causes; and, finally, capped at the close of the Pliocene with a lid of lava which has preserved them through subsequent alterations in the relations of water and land. The placer diggings of Timbuctoo and Sucker Flat were discovered in December, 1849, and were worked by rockers and small sluices on the surface in the winter season only, until hydraulic washing was introduced in 1865 and 1866, no claim using more than from 40 to 50 in. prior to that time. In early days the claims were all small, being 100 by 120 ft. each, and four or five owners of claims would work together, sharing the profits equally. Gradually the claims were consolidated, and more ground was taken up. As the surfaces were worked off, and the gravel in the banks was exposed, it became evident that more extensive appliances were necessary. The Blue Gravel Company were the first to construct a tunnel, in 1855, which was completed the next year; during its construction the work in the mines was suspended, but immediately on its completion it yielded very largely, and induced the owners of adjoining mines to build similar tunnels.

The next claim to the west of the Blue Gravel is the Pittsburg, as now consolidated, owning about 1000 ft. on the channel; next the Rose Bar, owning 2000 ft., all of which have run and generally completed deep bed rock tunnels. To the eastward the Blue Point, owning about 1100 ft.; the Smartsville Consolidated, owning 1200 ft.; and, lastly, the Enterprise, owning 1300 ft., have all run long and costly bed rock tunnels. Thence the channels pass through the hill to Mooney Flat, where is in progress the Mooney Flat tunnel.

The Blue Gravel claim has been one of the most famous gravel claims in the State, and is still showing good results since its incorporation in 1855. The tunnel cost \$80,000, all of which, except \$10,000, was paid from the profits of the upper lead worked through a deep cut, and a short tunnel of about 600 ft. still higher on the rim rock. Through this short tunnel about 10 acres were worked to a depth of 80 ft. The first clean-up of the claim through the first or 1400 ft. tunnel cleared off all the indebtedness of the company under which it had laboured for nine years previously. In May, 1864, the first dividend was declared. The head of water ordinarily used at this time was only 500. Up to January, 1869, the company disbursed \$643,000 in dividends. Another tunnel was run by the company 65 ft. lower down, which was completed in July, 1872, being 1700 ft. in length, and costing \$75,000; and through this tunnel the company is at the present time conducting its operations, using a head of 1000 in. of water.

The Blue Point Company has constructed a tunnel 2200 feet in length, which cost \$146,000, or \$63 per foot, and which it required three or four years to complete. The company has already declared \$250,000 dividends. The yield of these and other gravel mines is estimated at the rate of from 10 c. to 25 c. per cubic yard, and the following large amounts realised from some of them are recorded:—From the Pittsburg, up to 1871, \$237,000; Blue Gravel, \$1,700,000; Union Mine, \$120,000; Blue Point, \$500,000; Smartsville Consoli-

dated, \$400,000. The Nevada Reservoir Ditch Company, who own the Blue Point, have realised \$50,000 for supplying water alone to the adjacent companies. The same company own a large tract of land on the Blue Gravel and Blue Point channel, on which they cannot commence work until operations on the Blue Point cease. Another ditch company, the Excelsior, has also made handsome returns by the sale of its water, the exact amount of which I have not been able to ascertain.

I have only here specified some of the mines in this district which have been highly remunerative, without referring to the Pactolus and other claims, some of which are good, but others questionable. From a casual view of many of these mines, and taking into consideration the fact that they have been already worked for a number of years, I am under the impression that they are pretty well worked out, though some of them will doubtless continue to pay good dividends for a time. There remains, however, a considerable area of rich gravel deposit still untouched, promising results, when worked, of an equally brilliant character to any of the gravel beds that have been yet developed. This is the portion of land adjoining the Empire Ranch, Mooney Flat, and the Enterprise, and lying to the east of the Blue Gravel. The various claims to this portion of virgin soil have not yet been consolidated, but when this is the case, the water facilities being so great, and the auriferous deposits so extensive, it is safe to predict most favourable results to those who engage in the undertaking. This, of course, can only be accomplished by larger capitalists, who would buy out the present holders, who are unable to do justice to their claims. With plenty of available water, admirable facilities for dumping, and an almost inexhaustible bed of rich gravel, these claims, if consolidated, present a far wider and more certain field for enterprise and capital than do investments in companies which have been wholly or partially worked out, some of which are now on the market.

Unlike quartz mining, which requires local experience, as well as great mining engineering skill, hydraulic gravel mining is open to the comprehension of ordinary minds, so that anyone of common sense can judge of the merits of a mine himself, and it is only those who trust to interested speculators for an opinion who are deceived in the value of the mines of which I have spoken.

E. J.

San Francisco, July 10.

## GOLD MINING IN NEW SOUTH WALES.

SIR,—By last mail I forwarded you our Gold Commissioner's Reports, which will give your readers a fair general idea of the gold mining interest; but for the information of some of those who hold shares in special mines, I will more particularly refer to a few of them.

HAWKINS' HILL (Tambourine).—Krohnann's are now down over 350 feet, and just cut into a long-expected fresh belt of the narrow slate and quartz veins (in which such rich patches were found from the 180 ft. level down); for quite the last 100 ft. the shaft has been sunk with scarcely any gold-bearing leaders or indications till now, and should those just come on to gold bearing within the next few feet, and so prove the theory that the rich shoots of gold, instead of continuing down the underlay, dropped straight down vertically from one belt into another, then the "Hill" will come to the front again, and the shares now selling for shillings probably fetch pounds again. The assumption, also, that Parton Holman's claim has been systematically robbed for months past (as, whilst the shareholders never saw a dividend, the workmen in some instances were found to have saved (!) from hundreds up to even thousands per man), gives investors a little more faith in the whole line of claims generally, and I think it may fairly be said that things have now seen their worst. Also, the discovery, at 270 feet, in the Frenchman's—higher up the Hill, and next Holman's Freehold—of a rich vein which will go over 4 ozs. all round, and some hundredweights even 16 ozs. per ton, proves that Krohnann's and Parton's are not to remain the "kings of the castle." Down below the Hill, and on to the Turon river, very little is doing, as all the subscribing shareholders are "pumped out" for awhile—though most of them holding interests in claims on the real north and south line have faith yet, and only ask for time. However, many of them will not get it, as the new Mining Bill is strict in its labour conditions, and quite half the present leases will be forfeited for non-working, and many a fortune be then made out of them by those who have only the small capital even to take them up again—notably amongst these, perhaps, is the Queen of the Ranges, which carried a 14-oz. reef from the surface down, and was bought for 3000l. by the Holman, who has worked for the last seven years in, over, and under the Hill, and who knows the real indications, and yet did not pay bare wages, for the want of a proper perpendicular shaft to work it "miner-like," and so is stuck for want of another 2000l. expenditure. Although Krohnann's vein is surveyed (by triangulation) as right through it, the adjoining claim, the Sovereign, is also idle, after 1000l. being spent in sinking a shaft and tunnel in the wrong place. I mention these two specially, because they were looked on as the cream of the lower level ones, and as sure fortunes to the holders, and if these come to grief for awhile you may imagine how it is with all the rest.

Across the river, towards Chambers' Creek, the English company are working with a will at the Sir John Moore, but as their plan is deep and thorough treatment of the ground, there is no special show at present, though they cannot fail to get the same run of stone as is known to exist close to them in patches in more than one claim. They are also taking proper precautions to save all fine gold in their battery arrangements, and, altogether, have gone to work in such a thorough business-like practical way as must ensure ultimate success, if the ground be half as good as its indications. Their managing director here (a Major-Gen. Orr) has been quite a "take in" to the cunning, scheming miners, who were always bringing specimens of some "good thing," most of them being wholly misled at first by his extremely quiet, reticent, courteous manner, into judging him as soft as their former experience found in Sydneyites during the "fever," whilst he was quietly pumping them dry, and flabbergasting them at the end by one or two shrewd pertinent questions, which showed him master of the subject, and knowing far more of mining and minerals than themselves. After the way I and my friends were formerly victimised by these gentlemen, I confess I thoroughly enjoyed hearing that they had found more than their match at last, and it will be a good job for the colony also, if other home investors see that they have representatives out here who have the knowledge, skill, sense, and courage to checkmate all cheats, as there is room for the profitable investment of millions of capital in our various mines if judiciously done.

Some time since I sent you an account of the great auriferous lodes, dykes, and deposits at Brown's Creek, probably the largest known mass of gold-bearing stuff in one area yet found anywhere. The two companies are now at work. The Brown's Creek, 50 acres of Government, 14 years' lease, with a powerful 30 stamps plant, crushed a little over 2000 tons during the last three weeks, with a yield of 370 ozs. gold; for this month they expect over 500 ozs., and as the total cost is about 5s. or 6s. per ton, and the more the mine opens out the more stuff there seems. Its success may now be looked on as a matter of course. The Brown's Creek Freehold, opposite side of Creek, 111 acres, 20 years' lease, free of rent and royalty, 20-head plant, had their first crushing of 600 tons, but, owing either to malice or some extraordinary accident, over 40 lbs. weight of amalgam and silver escaped from the tables and buddles and was swept away before its loss was noticed; the ripples and boxes alone showed, however, 2 dwts. per ton, so that (accidents being in future prevented) this company also may be pronounced a success, especially as, after discharging all hands, samples of wash-dirt and tailings brought to Sydney, and crushed at Mort's, gave 15 dwts., and over 3 ozs. respectively.

The more these deposits are opened up, the more extraordinary is their mineral richness. At 50 feet depth the cap of a pyritous reef was struck, assaying 13 ozs. of gold per ton; 15 feet deeper it changed to a copper lode over 6 ft. thick, with every appearance of proving a real "Champion lode." On the adjoining block is a big hematite iron deposit, 70 per cent. ore in plenty; and within 400 yards is a vein of rich plumbago, also traces of silver; whilst, prospect wherever you will, for over a square mile gold or its traces



can be found on the surface, and as 80 ft. is about the deepest yet sunk in the different workings, some of them half-a-mile apart, and no indication of giving out, it is most likely that another 100 ft. will lay open still stronger lodes, and richer reefs and deposits. The great difficulty to contend with is the fineness of the gold, as, whilst every slow careful crushing of a ton or two shows the almost invariable 15 dwts. free gold per ton, the rough-and-ready battery of hundreds of tons per week yields only 4 or 5 dwts., so that it may fairly be assumed there is at least 500 ozs. lost for every 1000 tons crushed, and as the deposits really look like hundreds of thousands, if not even millions, of tons, any engineer who could devise a means of saving the bulk of this would make a fortune by his patent, and should any such wish to try the stuff practically I shall be very happy to send him home a hundredweight or so to experiment with (free of cost to him).

There have been some very rich patches struck at Wattle Flat lately, notably in Moyle's Company, Surface Hill, looking like 100 ozs. to the ton; also in Rutherford's and Weeber Leases, close to a crushing plant, and the cap of the reef in sight for months past, and only lately found to be rich!

The Iron Clad, near Cargo, is nearly ready for work again, the plant being completed, and some trial washings of borings and casings, showing extraordinary richness, which, if borne out by the main body of reef, will make it a great success.

We have done very little in large sluicing works here, as compared to Victoria, or San Francisco, but three or four really formidable works are nearly completed, one of them measuring 11 miles of races, fluming, and even tunnels. Newman's Box Tunnel, at Araluen, was finished May 31, but has not yet begun to wash up. It is a novelty here altogether; it starts from an outfall up the creek, or rather gully, on or about the expected level of the wash-dirt, at an average depth of about 20 feet from surface, so that where it ends in the paddock to be shipped the men work down to the wash-dirt level free from water, which of course drains down the 1000 ft. of 5 by 3 timber built tunnel, and so saves at least one 14-horse power engine and pump. It is very simple and strong, and if it proves the success expected will inaugurate a new method of economically working wet ground.

Holtermann, a 70,000l. miner of the rich Hawkin's Hill claims, has also been patriotically trying to open up the deep wet lead workings, never yet attempted fairly by steam, by erecting a very powerful steam-pump at the Mullion new range. The machinery will throw out 3000 gallons per minute, and the shaft is to down 400 ft. He has already spent 7000l., he tells me, and it will cost him yet a great deal more before the water below can be kept down sufficiently to work the golden wash.

Crushing plants are still to be bought for one-third their cost; many of them never even having started work after erection, and, of course, not one of them ought ever to have been bought, much less sent up country and put up, until at least as much stone as would have paid their cost had first been raised ready. Scattered as they are all over the country, they have this one good effect, that they tempt working miners to prospect for and try to open up reefs in the vicinity, which would otherwise have never been looked after, unless such a chance of crushing any payable stone had first existed.

Speaking generally, speculation is absolutely dead, with the bubble companies that excited it, and the healthful sign of a legitimate revival of mining is the fact of so many "likely" mines, only partially proved, perhaps, being applied for by parties of working miners to be let to them on tribute; also, the large amount of wages distributed so recklessly for a year or two through the colony has put thousands of men in sufficient funds to let them prospect for themselves, and the result is that new reefs are being continually found, and as the means of the finders will never enable them to develop them fully there will soon be a real field for investment of capital, with good chance of success. This time, with the lessons of the past to guide its application, and no doubt now mining will settle down into a steady business, conducted on known principles, and with as fair chance of success as ever any other mining country had, as, unlike Victoria, which has only gold, and one silver mine, we have gold, silver, lead, antimony, cobalt, plumbago, copper, tin, cinnabar, iron, coal, and diamonds, opals, and other gems, any of which is likely to be stumbled across by the tireless inveterate prospector for gold.

Whilst writing this, news has just come down from Hill End, that the next claim to Krohmann's, at 40 ft. deeper, has come to a fresh lot of slate and quartz veins, heavily charged with mundic, which is the exact nature of the rich veins, which at 200 ft. from the surface yielded about half-a-million, in 18 months, from half-a-dozen small claims. Should it make into the usual rich gold in a few more feet, the whole of the line from the Turon river on the south, to Holman's paddock on the north, will be as rich, and shares at a premium again; as, if the 100 up to even 1000 ozs. to the ton of stone makes again at this depth (nearly 400 ft.), it is likely to be even steadier and more permanent than the first belt above was, and if so, the old prices of 1000l. per running foot for these certainly wonderful mines may yet be had again.

Sydney, N.S.W., June 4.

P.S.—The new mail route to San Francisco has been the means of opening up a market in America for our tin, and several orders arrived for it, in smelted ingots.

#### MINING IN UTAH—THE TRIUMVIRATE.

SIR.—The resolutions adopted at the last meeting of the Flagstaff Company, and embodied in a special report of the directors, are a prolific source of reflection. It appears, first, that the company is indebted to Messrs. Davis, Stanford, and Co. for the trifling sum of 73,000l., paid in the shape of dividends; secondly, that the net proceeds from the mine have been swallowed by the expenses of beneficiation. From the official statements and computations of Mr. De Metz, the accountant sent out by the company, it appears that the average cost of extraction, hauling, smelting, and general expenses per ton of ore have been \$34.50 (7l. 3s.). Admitting with Mr. De Metz the average grade to have been \$76.50 (15l. 10s.) in lead and the precious metals, and that 4 tons of ore were required to make 1 ton of bullion, there appears a clear margin (including the refiner's profits, of \$142.25 (29l. 9s.) per ton of bullion, equivalent to \$55.56 (7l. 7s.) per ton of ore. The extraction being, as stated in the trustworthy report of Mr. John Eldy, equal to 16,300 tons for the twelvemonth 1873; and, allowance having been made for the loss of silver in smelting, there appears a net deficit of 120,620l. Where has this sum gone to?

There is then to be credited to the Flagstaff Silver Mining Company 73,000l. on questionable loans; 7000l. debts in London; 4000l. debts in Utah (suit brought by Capt. Forbes); 120,620l. on working expenses: grand total, 204,620l. But *passons à d'autres moutons*. The Last Chance, incorporated in London for 100,000l., and situated in Carr Fork, an offshoot of Bingham Canyon, must needs have smelters built (two of 18 tons capacity each) for the reduction of ore carrying on an average 6 per cent. lead, and \$37 worth of silver, but containing in lieu a large percentage of quartz, pyrites, and blende. The contract for supplying this desirable flux (!) to the Flagstaff Silver Mining Company was granted by the then manager—N. M. Maxwell—to Alf. Patrick for a period of six months, at the freight-rate of \$12 per ton, only double the price an ordinary teamster would have asked for. What the purchase price for this Last Chance ore was has been past finding out even to the accountants of the Flagstaff Mine—Messrs. Ford, Kemp, and Co.

The history of the Tecoma is especially interesting. Though "Miner," in his February correspondence to an English journal, has sketched in telling strokes the development of this company, yet there are certain features not unworthy, perhaps, of publication. I am familiar with the facts of both the Tecomas (English and American), have the following statements on the oath of witnesses whose veracity I had occasion to verify in the course of many years, and I do not know, on reading this tissue of falsehoods, dubbed a report, which to feel most of, indignation or pity, sorrow or sarcasm. Even Mr. Raynor St. Stephens's report, honourable as the gentleman undoubtedly is, I cannot exempt from the blame of self-

deception. Mr. R. St. Stephens gives the three years' yield of the American Tecoma as \$300,000, when the direct statements of the officers of Messrs. Aspinwall and Co. (these capitalists having been in possession only two years) place the total yield of ore at 1500 tons of 37 ozs. and 40 per cent. lead! These latter statements are most indubitably correct, as the writer knows personally both of the mine, and furnace-manager from long-continued acquaintance. I proceed now to Mr. Maxwell's report *seriatim*, transcribing literally:

MAXWELL'S Report, dated February, 1873:—"There are in sight now 3900 tons of ore, worth in gold and silver alone \$756,342, or an average per ton of \$193.78, and the average in lead 35.1 per cent."

MAXWELL.—The furnaces will be ready built in 90 days. By this time there will be accumulated at the furnace dump 2000 tons of ore; and the furnaces (two, of a capacity of 18 tons each) will be continuously supplied.

MAXWELL computes the net daily profits at \$45.60, equal per year, at 289 working days, to \$1,276,800, or 298,000l.

MAXWELL estimates the mine worth 300,000l.

And so *ad infinitum*. These figures need no comment, yet a few particulars will not be uninteresting. "Miner," in his February communication has already alluded to the propriety of shipping the ore to Truckee, 600 miles distant, when there was plenty of fuel and water near the mines; and of purchasing old works for six times their value. The rationale of the move cannot be doubtful. These works, when purchased, had the engine disabled, and the furnace linings burnt out. Repairing was carried on till July 16 (over 20 weeks), when one of the furnaces was started up, and continued in operation three days. The cause of the stoppage was given to be—in Truckee, the failing of the pumps; in London, the low percentage of the ore in lead. At this time it was strongly surmised in Truckee that the Tecoma Silver Mining Company was being induced to buy the "McDonald and Jennings" Mine, situated at Battle Mountain, Nevada, for the consideration of \$300,000.

The advantages of this mine will be appreciated when it is known that it was capable of shipping 15 tons of ore per week, and that Mr. N. Maxwell and S. Wessels were presumed to be part owners. On August 3 one furnace, and on August 4 the other one, were fired up, and ran respectively ten and eleven days, making a grand total of 24 days' run for one furnace. In this period 345 tons of ore had been smelted, equal to 14.7 tons of ore per day, and produced 45 tons of bullion, corresponding to a yield of almost 8 tons of ore (!) to 1 ton of bullion. The grade of the bullion was from \$163 to \$253, an average of \$194.40 coin, equal to 40l. 10s. in the precious metals.

We are, then, justified on the faith of these figures, whose authenticity cannot be gainsayed, to estimate the true percentage of the ore in lead at 20 per cent., and at from \$25.35 in silver to the ton (granting on the former a loss of 60 per cent., and of 10 per cent. on the latter). The company worked in the beginning with 60 bushels of charcoal to the ton of ore (an amount double to that of normal furnaces), afterwards no measurements were allowed to be taken. Part of this fuel was derived from Truckee contractors, and delivered at 18 cents per bushel, but the majority was made by the company at a cost to themselves of 30 cents coin per bushel. Superintendent S. M. Wessels, the experienced and efficient manager, received \$500 a month as chief officer of the smelting works, and \$300 (so it is reported) additional as superintendent of the charcoal burners. But enough of the Flagstaff, Tecoma, and Last Chance triumvirate. In turning our attention to other English properties, such as the Mountain Chief, we find instead of better almost worse results. The Mountain Chief was inaugurated in the spring of 1872, with a capital of 50,000l., in 5000 shares of 10l. each. I had an opportunity to examine this mine in July, 1873, and must confess it to be the most innocent of any ore or vein matter I ever met with. For a depth of 180 feet (this is the development the work had attained at my visit) the shaft penetrated the most exclusive solid limestone rock that could be imagined. The smelting works, originally costing \$25,000, have been sold a short time ago for half that sum under the hammer.

Shareholders on reading this will remonstrate with me for driving deeper the arrow in their bleeding wounds. I beg pardon; this was not my intention. I believe it is never too late to learn, and if the writer's voice of warning had been heeded when it resounded nearly three years ago many calamities would have been averted. It is due to English improvidence, optimism, and inexperience to reap the profits of the vast interests they so often entrust to reckless, unscrupulous, and ignorant men. Not only their agents in the Far West, but their own directors, are guilty of betrayals. The motives of the late directors of the Flagstaff and of Mr. Erwin Davis cannot be doubtful to any shareholder, and ludicrous it is to consider the trepidation, as I might call it, of Mr. Henry White in declining to impute to the late directors any motives. And the selection of the managers sent out is often more than pitiable. In my four years stay in Utah I have seen a great many men and a great many mines, and of the number of English mining men here I know only two whom for their integrity, their general and local experience, their knowledge and deliberate judgment, I would consider commendable. These are Messrs. — and —. As I can never over-estimate the importance of a sound expert's decision, I hope I may be excused if I transgress in this instance the limits of a perfectly impersonal and unbiassed communication. CONNOISSEUR.

Salt Lake City, June 1.

#### FLAGSTAFF MINE.

SIR.—As one of the sufferers from Flagstaff I sincerely hoped that Mr. Davis, or his representatives, would have been more open with those so lately chosen by the shareholders to conduct our affairs. It would have shown more good faith to have acted in unison with the board in place of the present antagonism. It appears from what we can gather that Mr. Davis is in actual possession of the mine for a mortgage given by the previous directorate upon ore at that time, and to a great extent still, in the mine; and although he has a claim of 70,000l., and has been for some time repaying himself out of the profits, he appears so perfectly satisfied that he has further invested in the company's shares to a very large extent—I am informed to several thousand shares—and this when prices ruled higher than they do at present. From this fact I take to myself encouragement as to his good faith in the future of the mine, and, therefore, intend hoping on that the former good times of par and premium may again return to recoup us poor deluded investors. It will be a great advantage to the general body of shareholders to hear Mr. Davis's proposition, therefore the sooner a meeting is called the better.

ONE WHO BOUGHT AT £16 PER SHARE.

#### THE FLAGSTAFF MINING COMPANY.

SIR.—In your review last week of the past proceedings and somewhat anomalous position of this company, attention was, I think, very properly directed to the irredeemable fact that the late directors had acted illegally. They had no power, nor did they seek to obtain it from the shareholders, to mortgage our property, and therefore to say that the vendor is a mortgagee in possession is altogether untenable, either in law or equity. The question, too, of the "ore contracts" is also equally illegal, and certainly could not be upheld before an equitable tribunal, bearing in mind the questionable circumstances and conditions under which they were given—for the purpose of enabling the directors (who gave these "ore contracts") to declare fictitious dividends, the larger proportion of which re-passed into the pocket of the vendor as the largest shareholder. Practically, therefore, the vendor advanced money to the directors against

ore to be delivered; with these advances dividends were paid, the greater part of which was repaid to the vendor.

All this is perfectly true—all very blameworthy, but it has been so far required by the ignoble removal of the board who betrayed their trust, and rendered themselves amenable to at least moral censure. This done, does it not behove the whole of us in our own personal interest to accept the terms now proffered, to lay down our admittedly powerful legal weapons, and to indulge in the assuasive influence of the "calumet of peace"? It is, no doubt, very pretty in theory to "avenge wrongs," or "to throw" (as an irate shareholder said at the last meeting) "the shares in the sea, and assert our rights;" but supposing this somewhat inconvenient operation had been performed, and we had "asserted our rights"—*bono?* The vendor is in Paris, without property in this country, possesses our mine, and his manager is working it. If the proffered terms of compromise are such as I have been informed they are, let us stifle our indignation, obtain possession of our property, and work it for our mutual advantage.

This course may not be commercially patriotic, but it is, clearly the dictum of common sense.

July 30.

A MEMBER OF THE STOCK EXCHANGE.

#### PAST AND PRESENT TIN MINING.

SIR.—It is said the present is a progressive age. Is it so? True, the difference between the methods now in use in the various departments of tin mining and 40 years ago is very great. Science has brought to our aid numerous and various kinds of machinery. A great deal has been written on tin dressing, the kind of grade that should be used, save-all tin floors, direct-acting, spring, pneumatic, and other stamping machines, &c., and the 40,000l. worth of tin that is annually driven down the Red and other rivers with the refuse of our mines. Forty years ago we had no Blake's stone-breakers, no calciners, no round buddles, no revolving or self-acting frames, no Limited Liability companies, neither were the pay-days put off for indefinite periods, as at the present time. The labourer and employer had confidence in each other. The tin was not washed off the mines as now, in thick puddle, but went into the shareholders' pockets in the shape of good substantial dividends. It was then customary to classify, weigh, or measure, and sample all tin first before it was put into the stamps, by which method the agents knew the quantity of tin that should be returned by the dresser—what would pay to stamp, and what would not. The slimes went into large catch pits, from which the water was discharged nearly pure, the slimes afterwards dried by the action of the atmosphere, and the tin extracted by the aid of simple machinery, with little or no loss, when compared with the present mode of sluicing. So long as the fine tin is driven from one stage to another, without allowing it time to settle, it will be held in solution, and float off with the thick slimy water that invariably leaves our mines. I do not condemn all the machinery employed in tin dressing; some of it is very useful, and a great improvement on older times, but machinery alone will not save the tin. Unless the slimes and tailings are differently treated, the water filtered (which is easily accomplished), tributing more extensively encouraged, confidence restored, with other reforms, we shall fail to make the majority of our mines pay.

We must also abolish that nefarious practice, imported from the other side of the Atlantic, of paying such enormous sums to the promoters of mining properties as has been done within the last few years with Terras, Fortescue, Blencowe, and numerous other mines in this county, which started with large capital, and came to grief without obtaining any knowledge of their merits, the result of inexperience and reckless management, combined with the practice named above, which ultimately brings discredit on and condemns a whole district. This district is known to abound in mineral wealth—the Great Polgooth, Great Hewas, and St. Austell Consols have yielded millions sterling worth of minerals. There is a large tract of virgin ground between and around these mines, equally rich, and only requires small capital, combined with judicious management, to open up the same and prove its richness, as is now doing at the Polgooth United, where they have opened on a lode in whole ground to surface, 40 fms. high 5 ft. wide, worth at least 80l. per fathom, and improving in value as they extend the adit level on its course. This is a very important discovery, made in the old-fashioned quiet way, and bids fair to become the pioneer to legitimate and successful mining in this locality, which is destined to become one of the greatest mining centres in the county.

In closing my remarks, I would remind your readers that my aim is the public good, as I have no interest in any mine in the county, except as a working man that "knows tin." COUSIN JACK.

St. Austell, July 28.

#### THE CHINA-CLAY AND SLATE TRADES FOR THE INVESTMENT OF CAPITAL.

SIR.—In commercial matters nothing is surer than a reaction after an extreme. This has been fully exemplified in the price of a staple article of commerce produced in Cornwall. The price of tin a short time since was at least 50 per cent. higher than at present, and, strange to state, a great number of those engaged in tin mining were so confident that the high price would be maintained that they concluded there was little to fear from any material decline in that respect. The high price not only brought an increased supply from tin ground already discovered in different parts of the world, but found new sources of supply, and those new discoveries appear to be of such magnitude as to guarantee the supply of immense quantities directly the price of the ore moves up but a very moderate distance from where it is at present. The effect produced by the rapid decline in the price of tin on our home tin mines has been something fearful. It has been a complete crusher to the majority, and a stunning blow to the richest of them, and the prospect of tin mining at present, viewed in the most hopeful light, cannot be considered otherwise than that of gloomy. What Chili has done for Cornish copper mining Australia bids fair to do for its tin mining.

The extremely high prices that have been ruling of late for iron and coal will also most assuredly produce its corresponding reaction, and the probability is that the time is not far distant when those who are permanently engaged and interested in those massive industries will have cause to regret that ever the prices departed from the bounds of commercial equity (although for a season in their favour), which has had the effect of sowing the seeds of a large crop of produce that will shortly ripen into a greater supply than the world's market wants, and thereby create a depression that will far outweigh the advantages of the preceding elevation. The practical conclusion to be drawn from these circumstances is this—the flow of the immense amounts of capital into those great industries will experience a check, and have to search for employment elsewhere. There is no want of schemes to absorb capital, and there is little difficulty in detecting the class that a large portion of them belong to—that of the bubbles, so that capitalists are careful about investing in them. Capital at the present time appears to be going begging for employment. Notwithstanding, foreign countries will, of course, manage to obtain as much as they can of John Bull's money in the shape of loans and otherwise.

There are most assuredly channels for much of the capital at home, which would return a fair interest, that are not beset with the enormous risks of some of the foreign speculations. It is not attempted to enumerate them, but one or two appear worthy of special attention. In the West of England there has been growing up over a period of a great many years an industry in china-clay, which has become massive. The extraction of china-clay from the hills has never been attended with any of those sudden jumps of fortune that more particularly belong to mining, but has gradually worked its way until it has become one of the soundest speculations, paying steady and high interest on the invested capital. A tour through the china-clay districts would well repay any one who felt an interest in channels for investments of capital in England.

Another industry is the slate trade of the country. For a very considerable time past the production of roofing slate has been growing more and more important. The landowners of the nation have of late turned their attention to the permanent improvement of their lands, and the result is the general pulling down of old



sheds and huts on the farms, and the rearing of proper dwellings and farm buildings in their stead, so that something like a national renovation of farm buildings has set in, which will absorb an immense quantity of slate. Our ever-growing cities and towns continue their increasing demands for the article. In addition to these is the export section of the demand. Putting the various sources of demand together, they form a permanent market of immense magnitude and extreme stability for the article. Those markets are supplied from slate quarries scattered more or less throughout the United Kingdom, but the largest portion comes from Welsh quarries. The quality of a large portion of the slates produced is very good; particularly from some of the leading Welsh quarries near Bangor. But if anyone wishes to see what is unquestionably the best slate produced in the United Kingdom he must go to Delabole, in Cornwall. The Delabole slates when compared with others rank as steel to iron. Considering the steel to represent in quality the Delabole slates, the others would stand in their various qualities as iron does to steel. This slate, after having been tested by the battle of storm and sunshine for many generations (perhaps centuries), does not manifest any signs of perceptible change in substance, but, like a bit of adamant, having outlived the age of the first building it protected, goes to perform the same office to another, and another. Slate quarrying generally presents a fair field for the employment of British capital. The demand for slate is sure and steady, and not subject to such fluctuations as many other staple articles of commerce. The prices are also steady and remunerative.

#### HOW TO REVIVE THE MINING INDUSTRIES OF CORNWALL.

Sir,—Several interesting letters and statements have lately appeared in the columns of the Journal with regard to the mining industries of Cornwall. The ores appear to continue in great abundance, but at considerable depths, and the difficulty would seem to be that the old-fashioned, tedious, and costly methods of mining continue in force, which in the end make the product to realise only about so much as it has cost. This, of course, can only be satisfactory to those who have lived and fed upon and absorbed the outlay. But as it rests with proprietors and governing boards of companies to direct the expenditure of capital, it is they who must be held to answer for the results. The impression seems finally, however, to be more or less definitely fixed in the minds of all the writers that mechanical boring must be employed to effect more rapid development, and also in the hope of reducing the cost. As to the first point, no doubt appears to exist, but with regard to the second, in view of the fact that the application has not been, and is not at present being, generally made, an impression of doubt would appear to prevail as to the decided economy, and as to whether any machinery exist which would be applicable in the general class of workings. One writer, whose letter is of strong force, and much to the point, speaks of the machinery as being very satisfactory for large tunnels, but in the general class of drivings, which he intimates may be reckoned of 4 ft. in width by 7 ft. high, the conditions, he thinks, might possibly be altered. The writer seems not to be aware, or to overlook the fact, that the great tunnels now being driven by boring machines are worked by continuously driving a small tunnel in advance, and the whole secret of enlarging and finally completing the tunnel depends upon the rapidity with which the advance heading can be driven. The enlargement and masonry can follow up rapidly enough when once a road is open. At the St. Gothard Tunnel the advance heading is 8 feet by 8 feet, and this is ample for working at least six of the largest sized and most powerful boring machines. It should be noted again that on the Continent in the great workings, the Mont Cenis, and also at the St. Gothard Tunnel, the workmen who manage the boring machinery are simply Italian miners, not mechanics; and it would be unnatural to suppose that English miners are less capable and expert in handling machinery of any kind.

If we may assume the general class of drivings to be anything like the size mentioned by your correspondent, then there can be no difficulty, at any rate, in applying small-sized machines; and for such the appliances to fix and hold in working are of light and simple character. We cannot conceive any difficulty whatever in employing in such drivings one or more machines of 3 ft. in length, 1 ft. of feed or travel being included in that length, the machine being held by an adjustable column, post, or stretcher (according as it may be called by one name or another), placed vertically, or horizontally, or alternately one way or the other, as most convenient, and the machine pointed and instantly fixed for boring in the required direction. There is no weight in the machine or the fixture that is not easily handled by one and carried anywhere by a couple of men; neither is there liability to breakage or derangement of the machine or appliance from any cause; the sharpening of tools is not one-twentieth of what is required for hand-boring; and as by the use of compressed air for working the boring-machines a pure, cool, and healthy atmosphere is at the same time maintained in the working, the men are naturally more capable of prosecuting the work with energy. As one such machine will do the boring of many hand-workers, the advisability of applying additional machines will be determined when the advantage of the one is ascertained.

It is altogether certain that the boring machinery can be applied in any driving where a miner can work. Let the size of a miner be compared to that of the machine, which is 3 feet in length, and not over 8 in. in any part of cross section. Also compare the motion of making a stroke by the miner and by the machine, and the effect of each. Our machines are proved to last from six to ten months in ordinary use without requiring any repairs or renewal of parts. The principal parts, and the appliances for mounting and holding them in working, last for years, and indefinitely.

It would not seem either to be sufficiently well understood in Cornwall, that air-compressing machines of moderate dimensions, but large capacity, are now made to furnish this admirable motive-power, and at the same time ventilation so advantageous, and which work with the equal simplicity, efficiency, and durability of a steam-engine. Neither does it appear that dynamite, or other of the strong explosives, has been brought in practice for its quota of advantage to mining operations. We mention dynamite the more prominently because of greater familiarity with it, and strong belief in its great economy, safety, and advantage over powder, particularly where, as in mining, the sole object is to bring down the material.

It must be clear that the advantage of the foreign producer is gained wholly or mainly through the adoption and use of modern appliances, and we think the principal of the difficulty in Cornwall may then be stated as owing to the non application of—1. Boring Machinery.—2. Air Compressors.—3. Dynamite.

We have long hoped for and solicited a special exhibition and trial of boring machines, which would quickly answer all questions as to what may have been done in the way of testing one machine five years ago, and also the better enable the mining public to judge of the various machines at present offered. Having received the highest award of the Miners' Association seven years ago in connection with boring machines, other engagements have since prevented our attendance at annual meetings. We are prepared, however, to send one or twenty boring machines to Cornish mines, and if they do not give results advantageous over hand boring we will take the machines back within any reasonable period, and without any charge for their use.—London, July 29. MCKEAN AND CO.

#### PERRAN AND NEWLYN DISTRICT.

Sir,—Permit me to ask, through your most valuable Journal, why practical and intelligent miners do not come out and make known to the mining community that this district abounds in mineral wealth, such as rich iron ores, tin, copper, lead, blende, &c. I am really sorry such properties should remain idle so long when they could be worked, and that to advantage and profit. Had it not been for the Cornish Mineral Line this district would be almost unknown, and hidden to the eyes. What a pity, then, when such facilities are now offered to capitalists to invest their money in legitimate mines such as are to be found in the district, they are not availed of. It only wants mining energy, good management, and economy to bring it into a paying and profitable one. Then I ask the intelligent why they do not come out and show what is to be found here if worked?

If gentlemen disbelieve or doubt my authenticity, my advice is that they come and see for themselves. This I should recommend, as then I think such parties would be satisfied, and fully concur in the reasonableness of the information now offered to them. I am sorry to see so many valuable unworked properties now idle for want of means and mining energy. These sets are obtainable, and it only wants a mining spirit to bring the district into a good paying one, second to none in the county. Just look, Sir, at the advantages offered at present through the construction of this important mineral line being in close proximity to many properties which can be legitimately supplied with materials, &c., at a great saving and with little trouble. In a former letter the names of a great many unworked mining properties were named, and if such properties could be brought into notice and re-worked with good management, they would be of long standing, and I do not not paying ones. There are also several maiden properties in the district, in which a great many important lodes cross. The situation, locality, and strata are everything that can be desired, and it only remains with the capitalist to bring them into a profitable state.—July 23. A WELL-WISHER TO MINING.

#### THE TREATMENT OF POOR ORES.

Sir,—The test proposed by "Argus" in last week's *Mining Journal* is so thoroughly practical and business-like that the shareholders in the Prince of Wales Company may well congratulate themselves upon the admirable course which the Chairman adopted at the meeting. It was pointed out at the meeting, I think by Mr. Rosewarne, that as they were making a practical test at the adjoining mine of New Consols, we might as well save even our 1000, until they had entered the Dividend List; but the enthusiasm of Mr. Landau was too much for the more sanguine shareholders present, and neither Chairman nor secretary, although the hints they gave were strong enough in all conscience, could keep them in check, the result being that tanks and old iron are to be added to the outlay on impracticable stamping machinery. I was almost surprised that the question was not put to the Chairman as to whether no one was present interested, or about to be interested, in the sale of the invention, though I felt it might seem invidious to make the enquiry; but now that a fixed course is determined upon I hope nothing will be permitted to make the trial unconvincing.

A parcel of 50 tons is almost too large to be conveniently salted with other than the sodic chloride referred to, but the cost of assaying, salting, calcining, precipitating, and otherwise manipulating the ore must be taken carefully into account, and set against the price for which the metals got out are actually sold, because the contents of a metallic mass may be of more imaginary than real value, owing to the metals being so combined that the cost of their separation exceeds their aggregate value. Thus some Devon New Consols ore was proved by analysis some 12 or 14 years since to contain 85% worth of metal to the ton, and a loss was made upon buying it at 5s. per ton, at which price a second parcel was positively declined. The comparison of the nascent process with those of the Huella district, Augustin, Claudet, and others leads to false conclusion, because all the processes which have proved successful have been devised for the treatment of, perhaps, millions of tons of ore of comparatively uniform composition, and possessing peculiar facilities for treatment.

All these processes when tried beyond the works for which they were intended have lamentably failed, and Claudet's success at Widnes was due to his ability to purchase large quantities of nearly uniform waste ore, and to modify his process to suit every particular parcel. In the case of Cornish and Devon ore the composition differs too widely to permit of these modifications to commercial advantage, and hence the obstacles encountered by inventors and the rapid abandonment of the processes from time to time proposed. Let the 50 tons at the Prince of Wales be taken from ten different parts of the mine, assayed, and, the whole having been mixed carelessly, treated by the nascent process, and we shall then know something of its commercial value for the Prince of Wales Mine. July 29. A SHAREHOLDER.

#### CRENVER AND WHEAL ABRAHAM.

Sir,—It cannot but be exceedingly gratifying to the shareholders to observe the position in which this mine now stands, as shown by the by-monthly ticketing of copper ores in last week's *Journal*. Owing to the vigorous policy of development now being carried out by the directors (unless I am very wide from the mark in my calculations), and if it continues to increase its returns in the same ratio as it has been doing the past six months, it will not be long before it must be in the Dividend List, as the present returns of copper are, at the present low price, almost sufficient to pay cost, and now that they have started tin-stamps they may hope to have much larger returns from that department. H. A. Brighton, July 27.

#### WEST GREAT WORK MINE.

Sir,—I am sorry to occupy your space again, and merely write to say that Mr. Sharp had nothing whatever to do with my previous letter.

A SHAREHOLDER.

[For remainder of Original Correspondence, see to-day's *Journal*.]

#### Meetings of Public Companies.

##### GREAT WESTERN COLLIERY COMPANY.

A meeting of shareholders was held at the City Terminus Hotel, on Monday.—Mr. GEORGE SQUIER BRYANT (of Bristol) in the chair. The report of the directors stated that for the acquisition of the steam coal, and for the purpose of providing the required machinery, there have been issued 2962 new shares; 13,913, is in the bankers' hands, and a further amount of 5924, has shortly to be received, making a total of 19,837, available cash on the steam coal account, and it is hoped and believed that this sum will be sufficient to complete the necessary work. For the purchase and prosecution of the Tynmawr Colliery 20,000, has been raised in debentures of 50s. each, repayable in three separate sections, severally falling due at the expiration of three, four, and five years from the date of issue. On this Tynmawr property 20,874, 17s. 2d., has been expended. After making provision for wear and tear, bad and doubtful debts, law proceedings, and 1000, for interest on debentures (Tynmawr) there appears a profit of 14,126, 4s. (as compared with 27,997, 17s. 3d., the previous year, and as against 8531, 1s. 8d., the year ending June, 1872); from this 14,126, 4s. there has been deducted the interim dividends, already paid, of 6843, 1s. 4d. and 4679, 8s. 10d., together amounting to 11,522, 10s. 2d., equal to about 16 per cent. per annum on both the productive and the unproductive capital. The remaining small balance the directors recommend should be carried over to the next year.

On reference to the audited accounts it will be seen that 2188, 1s. 5d. has been laid out in the works of the colliery, for which no special provision has been made: On the Tynmawr property (balance), 874, 17s. 2d.; on the Hafod Pit and drift, 1313, 4s. 3d.; total, 2188, 1s. 5d. The coal from the Hafod seam has been reached and analysed with very satisfactory results. The sinking the Large Pit to the steam coal has progressed very satisfactorily; it is believed that the hardest portion of the rock has been passed through.

The Chancery suits brought by this company against the vendors of the colliery to this company, referred to in several previous reports, have been abandoned. The directors desire to express their firm opinion in the soundness of the property and their strong conviction that the shareholders are likely to be in the long-continued receipt of satisfactory dividends, especially so when the Hafod and steam coal shall have been won and brought into the market for sale.

The report of general manager (Mr. H. Briscoe) stated that the operations for reaching the steam coals, which were commenced last year by sinking a pit from the surface, as required by the lease of those measures to the company, are proceeding satisfactorily. The pit is now down 170 yards, which, he believes, the fastest sinking on record in the district. The deepening of the old pits at Great Western and at Tynmawr is progressing as quickly as the nature of the work will permit. It is expected the steam coals will be reached by August, 1875. Judging from the past, he sees no reason to fear that the estimates which were made last year of the cost of the sinking operations were too low; on the contrary, although wages have considerably advanced, the two pits on the Great Western property will probably be completed for a less sum than that which was raised for the purpose. The shaft alluded to in his last report as in course of sinking has been finished to the Hafod vein. The coal having been found to be of good quality, operations were commenced for the purpose of working it by a drift, which is in progress, and will, in all probability, be completed by October next. The works, plant, and machinery have been maintained in good order. They have been free of strikes, and have had no disputes with the workmen during the past year.

The CHAIRMAN, having referred to the resignation of Mr. Day, Q.C., from the board, said it was his duty to move the adoption of the report and accounts. Those documents were tolerably full, and contained an accurate statement of the affairs of the company; the accounts have been overlooked by their accountant, Mr. Swinbank, and audited by Messrs. Johnson, Cooper, Wintle, and Co. They showed that during the past year there had been a profit of 14,126, 4s. after making provision for renewal of engines, wagons, stock, and bad debts. As compared with the previous year it was not favourable, inasmuch as during that period the profit realised was 27,997, 17s. 3d., but it was far better than the result attending the operations for the year ending June, 1872, when the profit did not exceed 8531, 1s. 8d. They were all aware of the great change that had taken place in the coal trade, during which he thought the profits had been quite as good as could reasonably have been expected, being equal to 15½ or 16 per cent. upon the productive and unproductive capital of the company, and upon the original capital it showed a profit equal to a dividend of 28½ per cent. There was every reason to believe that when the

steam coal shall have been won this company would be in a very satisfactory condition, inasmuch as the profits of steam coal were much higher than those of ordinary house coal. Having stated that he should be glad to reply to any enquiry or afford any further information desired, he moved that the report and accounts be received and adopted.—Mr. PALMER seconded the proposition.

Mr. SURTESS handed into the Chairman a series of questions. Mr. SWITHINBANK, replying to those which referred to the accounts, stated that the amount written off on account of depreciation was the carrying out of the arrangements talked of at the last annual meeting, as at that time no depreciation whatever had been allowed for working out the coal.

The CHAIRMAN added that Mr. Swinbank brought this matter before the board, and it had also been recommended by the auditors, and the directors had acted very wisely in clearing off that account. As to the Tynmawr purchase, he believed the item of 17,500, included the purchase of plant, engines, materials, &c., necessary for the further sinking of that shaft. The item of 3000, for law charges was left over last year, which added to the 891, made the estimated law charges 1191, an amount the directors felt would be amply sufficient to meet all the costs in connection with the Chancery suit. Part had been paid, and the remainder estimated. At the last board meeting the estimate had been increased by 3000, so that next year the actual amount was likely to be less than estimated. As to the valuation, he believed Mr. Holcomb was not disposed to come forward unless he were paid for it, and the suit had been stopped upon very strong representations from shareholders. These representations were made immediately after his (the Chairman's) introduction to the board, and accordingly arrangements were made for stopping it. As to Mr. Fothergill's contract, he certainly thought it most undesirable to go into that question at a public meeting. The board, after mature deliberation, had settled the matter with Mr. Fothergill, and whatever had been done shareholders might rest perfectly satisfied was best for the company under the circumstances. It, of course, resulted in a loss to the company, inasmuch as they had now to provide coke to Messrs. Fothergill at a loss. It was impossible to state what loss, because so many thousands tons had to be supplied. As to how it would be proposed to raise funds to sink Tynmawr shaft would be one of the first matters the new board would have to consider, but how they would decide it was impossible for him to say.

Mr. BRISCOE, replying to a question, stated that the Hafod vein had been reached about November last, and the coal had turned out to be extremely good; assays of it had been made at the Government School of Mines with a very satisfactory result.

Mr. SURTESS contended that the item of 7500, was money lent by the old shareholders to capital account (No. 10). When the colliery was started it had no depreciation account, and at a subsequent meeting it was resolved that there should be no depreciation account, and three years ago, when he was upon the board, they divided the amount which had been put aside as a depreciation fund. There were 1500 shares unallotted, and if the directors did not choose to make a call, and to pay back the amount lent from revenue, they could issue those shares at a price fairly agreed upon. He could not think it fair to take 10,000, in one year and wipe it off, and thought that 7500, should continue to be carried to a suspense account, to be dealt with hereafter. He was sorry to find that Mr. Briscoe had withdrawn his intention to join the board, because (Mr. Surtees) considered the present condition of the colliery was mainly due to his energy and ability. He concluded by moving an amendment "That the report and accounts be not adopted, that the sum written off for depreciation be erased, and added to the balance of 3000, and that the 7500, be carried to a suspense account, leaving 11,631, to be carried to profit and loss account."

Mr. WARD seconded the amendment.

Mr. PALMER considered it most absurd to expect the holders of new shares to subscribe money to put into the pockets of the holders of old shares, which would be the result of the proposition of Mr. Surtees.

Mr. NORRIS said for other reasons it would be most unwise to call up the un-called capital.

The amendment upon being put was lost, when the motion adopting the report was carried.

Major GORDON, who had been a director of the company for nine years, expressed his intention of not offering himself for reelection, because he believed it was the general wish of the shareholders there should be an entirely new board.

Upon the proposition Mr. NORRIS, seconded by Mr. J. MILLER, the following gentlemen were elected directors:—Mr. T. Alexander, of Pontypool; Mr. A. S. Harding, ironmaster, of Bristol; Mr. S. Laing, of Bristol; Mr. H. Major, colliery proprietor; and Mr. W. Tribe.

Messrs. Johnson, Cooper, Wintle, and Co. were re-elected auditors.

A vote of thanks to the Chairman concluded the proceedings.

##### KINGSTON VALLEY LEAD MINING COMPANY.

The statutory meeting of shareholders was held at the offices, Gresham-buildings, on Tuesday.—Mr. S. F. PORTER in the chair. The notice convening the meeting was read.

The CHAIRMAN said the present meeting had been called pursuant to the provision of the Act of Parliament, and although these meetings were usually of a very formal character, this occasion afforded him an opportunity of congratulating the shareholders upon the satisfactory progress that had been made in the development of their property, and upon the material and important improvement that had taken place in the value of the lode even during the last few days. But, like all enterprises of this character, money was required to successfully continue their operations, more particularly the erection of dressing machinery and the sinking of the shaft to a greater depth, and for that purpose the directors considered it desirable to issue the balance of the unallotted capital, amounting to about 8000 shares, and to offer them *pro rata* among the present shareholders. The directors had been closely considering the question of expenses, with a view to their reduction; at present the heaviest item was for coal, and it had been suggested by Mr. Richards that they could utilise a stream of water which was in the valley just below the mine. As the water that could be obtained from this stream, as well as that pumped from the mine, would be sufficient to keep their water-wheel at work, probably, six or eight months in the year, the utilisation of this economic power would prove to be a very considerable and permanent saving to the company, and, therefore, deserved immediate attention, as their coal item now amounted to 50s. per month. The erection of the dressing machinery would be rapidly proceeded with, and they hoped and believed that in eight or ten months from the present time they would begin to reap the fruits of their labours. A great deal of ore ground had been laid open, and altogether they seemed to be in a very satisfactory and encouraging position.

The report of Mr. G. F. Richards was then read, which stated that the engine-shaft has been sunk below the adit level 11 fms., and completed to a total depth of about 28 fms. from surface through a splendid channel of ground. At a point about 9 ft. up from the present bottom of the shaft they excavated ground for trip-plant for the lodgment and proper discharge of the stuff. From the end of this pit they commenced the driving of the cross-cut south for the intersection of the lodes. At a point some 2 fms. south of the shaft they intersected a large flooken, with friable quartz interspersed therein several feet in thickness, and passing beyond this, through a mixed stratification of ground for a short distance, they then merged into the lode, which proved to be from 10 to 12 ft. in width, and of a very massive character, consisting principally of quartz, capel, and sulphur mud (iron pyrites), with a branch about 6 in. wide, containing blende, lead, iron pyrites, and spots of argente, or sulphure of silver. This latter branch is on the northern portion of the lode, and on the southern side the lode also produced a proportion of lead ore. Extending the cross-cut they intersected about 5 fms. further south another rich lodgment flooken, with sulphur mud, prlan, and lode, composition, in some respects similar in character to that described above. The cross-cut has been driven south of this latter lode 10 fms., or a total length of 20 fathoms. The two main points in the deepest, or 18 fathom level, constitute an important and valuable improvement in the lode. Here also in these two parts the lode has assumed a more definite character, with a greater concentration of the ore, and taking all other favourable circumstances into consideration, the operations at such a shallow depth are so far very satisfactory, and from the results already obtained they have every reason to anticipate the laying open of a very valuable mine, especially in prospecting such a large and masterly lode in the vicinity of the rich cross flooken and the other north and south veins passing through the property. The sinking of the engine-shaft he suggests should be resumed with all speed, and other vigorous operations be commenced. It will also be necessary to erect requisite dressing machinery.

The CHAIRMAN said it was the intention of the board to have had a report from Mr. Thomas Sopwith, jun., their consulting engineer, who was a man of considerable eminence in these matters, but unfortunately he was laid up with rheumatism fever.

Mr. RICHARDS, in reply to a question, stated that his father (the manager of Devon Great Consols) had visited the mine, but did not go underground. He was much pleased with the ore he saw at surface, and with the mine generally. Capt. Hancock (of the Old Treburgett Mine, where ore of a similar character was being produced) had also expressed a very high opinion of the property. In explanation of his report, he pointed out the several operations by means of a section, and in reply to questions stated that there were two distinct lodes. Until yesterday he had no intention of being present at this meeting, but he found upon going underground such an important improvement had taken place that he at once resolved to be present. The box of ore on the table he broke himself yesterday morning. In some parts of the lode there were distinct ores of silver, and they might come upon a deposit of it, or it might continue to accompany the branches of lead. The assays gave from 180 to 220 ozs. of silver per ton. The lode being carried in the present end was 4 ft. wide, and in the south part there was a distinct branch 12 in. wide, which would be taken down in the course of driving. The north part of the lode was 3 ft. wide, and would produce 3 to 4 tons of lead and blende per fathom. The lode continues to considerably increase in strength and character, and the silver-lead became more concentrated in form as the depth was increased. He proposed to sink the shaft about 2 fms. deeper, when it would in all probability reach the lode; it would then be advisable to sink on the course of the lode.

Mr. FORBES said it was most satisfactory to find that every anticipation held out by Mr. Richards had been more than realised; and the important information which he had brought from the mine this day could not fail to make them all more than ever satisfied with the great value of the mine. They had the prospect of having rich silver deposits, the assays were perfectly wonderful, samples having yielded 226 ozs. of silver per ton, and even the general produce of the lode gave 26 to 30 ozs. of silver to the ton, making the lead of very considerable value. There was a large quantity of ore in sight ready to be stoped away, in addition to a considerable quantity waiting to be dressed.

Mr. RICHARDS said there was a long piece of ore ground standing between the



two levels which required to be communicated before stopping operations could be commenced.

A vote of thanks to the Chairman, directors, and Mr. Richards was passed.

The CHAIRMAN, in acknowledging the vote, said that no effort would be spared to push on the work to a successful result. The directors' interest was identical with that of the shareholders, as not one penny had yet been received by anyone up to the present time. The meeting then separated.

#### THE BRONFLOYD COMPANY.

An extraordinary general meeting of shareholders was held at the Guildhall Coffee House, Gresham-street, London, on July 24.

Mr. J. B. BALCOMBE, on assuming the chair at the special request of the meeting, said—This meeting is duly constituted, there being present 18 members, holding 9987 1/2 shares; and there are proxies of 23 members for 9990 1/2, equal in all to 7991 votes, out of an aggregate of 20,000. The business of to-day is very simple, and need not occupy much of your time; but, after it is concluded, I shall invite you to consider the scheme prepared for the continuance of the mine. I am told by the solicitor that the resolutions of the 8th inst. require to be moved en bloc, and I therefore beg to move the first as an extraordinary resolution: "It having been proved to the satisfaction of the members that this company cannot, by reason of its liabilities, carry on its business, the affairs of the company be wound up voluntarily." Seconded by Capt. H. A. BENNETT, and carried (two dissentients only, representing 434 votes).

Resolved unanimously—"That Mr. J. B. Balcombe, of Aberystwyth, in the county of Cardigan, gentleman, and Mr. C. Herbert Stokes, of Talsien, in the same county, gentleman, be and are hereby appointed the joint liquidators of the company."

Mr. ROBERTS: At what cost will this liquidation be effected?—The CHAIRMAN thought 1000, would cover all expenses, although in this case the expenses would be greater by reason of the proceedings in Chancery, and the time he had been obliged to give to the matter in London. The petition would, however, be withdrawn this afternoon; the debenture-holders having, at his suggestion, made a voluntary contribution of 15l. per debenture towards a fund for the purchase of the petitioner's claim, and of two other judgment debts.

Mr. DRYDEN: Suppose another shareholder puts a petition in?—The CHAIRMAN: The present petitioner's claim arose for goods supplied at the mine. A shareholder holding paid-up shares cannot petition; he has no right of petition, and any such attempt would only involve him in costs.

Mr. DRYDEN: It was all very well for the debenture holders to take credit for the advance of money referred to, such was only done because they were debenture holders, and to protect that interest.—The CHAIRMAN: Really this is very unfair—they are also shareholders; besides, when the debentures were created a *pro rata* allotment was made to every member—then 249 in number—only 13 responded, and thus the mine has been ever since carried on by the funds provided by those 13; and had the most eminent success resulted from the explorations the non-contributing shareholders would have reaped equal advantage. The present crisis belongs to the members, and as such it must be met, and we have to consider whether we will provide any more to carry the works on; the debenture holders know from experience that such cannot be had rateably, as the calling powers on the shares of the company are exhausted.

Mr. DRYDEN: Yes; but you and all the older shareholders have had your capital returned in dividends, whilst others, like myself, came in late, and paid for our shares on the eve of the difficulties of the mine.

The CHAIRMAN: That is a misfortune the company cannot recognise. Limited liability gives protection to shareholders, yet when shares are paid up, and further capital becomes requisite to develop, however promising an undertaking, it is in practice always found impossible to procure a rateable contribution—hence the necessity for the present meeting.

A SHAREHOLDER remarked that he had understood that Mr. Balcombe had been having 7500 a year as managing director.—The CHAIRMAN was sorry so unfounded a statement should be made. His remuneration had been 1500 a year, and out of that he provided for the company's office and expenses; such remuneration was part of the directors' fees fixed by the Articles of Association at 2000 a year. He did not think any company in the kingdom was more economically managed. The directors regretted, but could not help, the unfortunate results of the last three years.

Mr. DRYDEN maintained that the mine was being worked at a present profit of 1200 per month.—Mr. BALCOMBE: The first three months of the year had realised a profit, which he believed would have continued but for the severe drought, and as to which the agent reported repeatedly that it was useless to draw even the reserve ore to surface, as the water supply only enabled the dressing to go on for about eight hours a day.

Mr. STOKES said he was the other liquidator, and since the meeting in Aberystwyth he had been twice at the mine, and underground through every part of it. Being connected with mining in the neighbourhood, he was asked at the last meeting to take the liquidatorship, it being presumed that his knowledge of such affairs would be advantageous. He did not care much about the remuneration, but he certainly thought his expenses ought to be paid; and, more than that, he had induced the manager of Esgrair-hill to go over the mine, and now held his report.

A SHAREHOLDER thought 1000, little enough for the trouble.

Resolved unanimously, on the motion of Mr. ATKINSON, seconded by Mr. DRYDEN:—"That the remuneration of the liquidators be the sum of 1000, to include all expenses."

Mr. ROBERTS: The agent valued the ore in reserve in June, 1872, at 50,000.

Mr. DRYDEN did not believe such existed now between the levels, although the bottom one has some capital ore.

The CHAIRMAN said it was useless to talk of 50,000, in reserves when the company was in the throes of liquidation. It was customary in all mines, when shafts were sunk in, and levels driven under a course of ore, to estimate as reserves half the value of the ground, and to make a mistake might be made, but if the agent were present to-day he would tell the meeting the same thing. The mine now was (through scarcity of water) working eight hours a day only, and consequently at a loss. One of the shareholders now present (Mr. Crofts) had been with Mr. Stokes to the mine; he then induced Mr. Crofts to purchase a debenture, and to ask him (the Chairman) whether he would sanction the expenditure of five guineas to secure an independent report for the use of this meeting. This was assented to, and the services of Capt. Abel Paul, of Esgrair-hill Mine, secured, and he would ask Mr. Stokes to read the report (enclosed).

Mr. STOKES, in reply to some questions, said that, whether favourable or not, it was a thoroughly trustworthy and independent report, on which the shareholders might rely; the mine required further capital to open up fresh ground.

Mr. BERRY: What has been the total expenditure on the mine?—The CHAIRMAN (speaking from the balance-sheet to June 30) said the receipts, including 20,000, capital actually paid—that is, leaving out the 30,000, nominally added to the capital in 1870—had been, from all sources—i.e., ore, capital, and loans, 79,425 1/2, and of this 58,426 1/2 had been expended on the mine, and 21,000 paid as dividends to the members.

Mr. DRYDEN reiterated that he was certain the mine this year had, up to May, realised a profit of over 1000 a month; it was now going to be foreclosed by the debenture holders.—Capt. BENNETT: Contribute an even sum to them then, and carry on as we are. The present debenture holders will wait for their money; but will that settle these difficulties?—Mr. DRYDEN: Yes, with the profits I can show. (But the figures he adduced did not satisfy the meeting that his assertion was correct.)

It was then moved and seconded "That the liquidators be specially instructed to prepare and carry out a scheme for the liquidation and closing of the affairs of the company upon the basis of the sale and transfer of all the property and assets of the company to a new company, formed or to be formed in the first instance, by some of the holders of the debenture bonds of the company, for the price or consideration of a sum sufficient to discharge all the existing liabilities of this company, such scheme to embrace some plan for preserving to the present shareholders an optional opportunity of acquiring an interest in the said purchasing company."

This was carried, with two dissentients, as before: the CHAIRMAN remarking that the holders of more than half the shares had assented to take new shares of the reduced capital, and to pay 15s. per share on them, in calls of from 2s. 6d. to 5s. per share, as required.

The CHAIRMAN then explained in detail the proposed arrangements for the new company, and the SOLICITOR read the Memorandum of Agreement, which, amongst other matters, provided for creation of 100 mortgage debenture bonds of 1000 each, bearing interest at 6 per cent. per annum, with option to convert into paid-up shares. Of these 50 will be issued in lieu of and discharge of the debenture bonds, overdue interest, and the sum subscribed to save the mine from compulsory liquidation; and there would then remain 40 of such debentures for sale.

After some discussion, it was agreed that the shareholders in the old company should have priority in the issue of such 40 debentures, the proceeds to be applied to the discharge of the remaining obligations of the company.

Resolved—"That the agreement bearing date July 24, 1874, and expressed to be made between the Bronfloyd Company (Limited), the liquidators thereof, and Capt. H. A. Bennett, on behalf of the proposed new company, having been read, such agreement be and is hereby approved; and the above-named liquidators be directed to affix the common seal of the company thereto."

Resolved—"That the said liquidators shall be and are hereby authorised to dispose of the 40 mortgage debenture bonds of the intended new company, which they are to receive at any price not being lower than the 80s. for each 1000 bond, payable as they may decide; and that these debentures be first offered to those members of the old company who do not accept an allotment of shares in the new company, and afterwards as the liquidators may determine."

Resolved—"That the intended new company be allowed to use and adopt the name of the Bronfloyd Company (Limited)."

After a unanimous vote to the Chairman, the meeting then formed itself into a conference, when the Articles of Association for the new company were read, agreed to, and signed, and instructions given to register the same forthwith.

#### THE BRONFLOYD COMPANY.

TO THE SHAREHOLDERS.—There having been a feeling expressed at the general meeting, held on the 8th inst., that before completing the arrangements for extra capital for the prosecution of the mine it would be well to have a thoroughly independent report on the property from a competent man, we selected Captain Abel Paul, of the Esgrair-hill Mine, who is well known to one of us (Mr. Stokes), and below is his report.

Talsien, July 21.

Esgrair-hill Mine, July 21.—In accordance with your instructions, I yesterday visited and carefully inspected the Bronfloyd Mine, both underground and at surface. Entering the mine by the deep adit, I descended to the 40 fathom level of No. 3 shaft, which is about 10 fms. below the adit, the upper levels having long since been worked away. In this level there has been considerable ground stoped away on the middle lode, and, as I am informed, at great profit. In going west, however, the lode became disordered and split into branches, and the level was then turned north-west to cut the north lode. Having done this, and the lode found to be productive, a great quantity of ore ground was then stoped away. This level (40) was driven westward about 60 fms. beyond these stopes to find another shoot of ore, and a cross-cut was started near the end to reach the south lode, the run of which, in this drive, having been left on the south. This might, with a further trial, be judiciously continued until the lode is proved.

No. 3 Shaft, North Lode, 52 fms. In driving east considerable ground has been taken away: the lode is 15 ft. wide, with strings of ore throughout, and, as the lode proved productive up to the very end, I cannot see why this level was not pushed further. From this a cross-cut level (Lloyd's) has been recently driven south, and the middle lode cut thereby. The lode which is in branches, is about 30 ft. wide, composed of lead, carbonate of lime, and quartz. It is in a good

channel of ground, and very promising. I would recommend the company to drive back east from the cross-cut, the course of the lode to No. 2 shaft, a distance of about 66 fathoms, which would be a thoroughly good prospect.

I consider this is one of the most promising points of the mine.—62 fms. Level: In the eastern end the lode has been cross-cut for 10 fms. without finding the south wall; the ground contains very favourable indications—galena, silver-lead, barites, and carbonate of lime, with quartz. The end is letting out water freely. This is another very desirable point to be further developed, and with good chances of success.—73 fms. Level: The same favourable indications appear in this eastern end as in the 62, but the western end is not in so kindly a stratum of ground.—84 fms. Level: Here the lodes appear to have come together, and west of the shaft a cross-cut has been driven for about 25 fms. entirely in lode. From one part of this cross-cut a level has been opened, and the lode driven on for about 6 fms. The end has a very kindly appearance, with water oozing from it, which is always a good sign. The remaining portions of this level were full of stuff, and could not be seen.—96 fms. Level: This is the deepest point of the mine, and the drive west is in a more congenial channel of ground than the western ends of the upper levels. The lode produces 1 ton of lead ore per fathom of lode, which is 9 ft. wide. This, of course, will pay for working, and ought to be continued. In addition to the two lodes worked on, there is a south lode which has not been seen in depth, unless it is in combination with the massive lode proved by the 25 fms. of cross-cut from the 84. Judging by the surface or shallow workings (opened, perhaps, a century back), this lode may possibly present a new field of profitable operations; and to test this, at little cost, I would first recommend the continuation of the cross-cut from the 40; or, the same lode may be reached more eastward by continuing further South Lloyd's cross-cut from the 52 of No. 3 shaft. In conclusion, I beg further to recommend that the new discovery in the 52 be opened up as suggested, and also that the eastern ends of the 62 and 73 fms. levels be pushed on where the ground has already proved productive, and is at present very promising. The lode in the 84 should also be further opened up. Great quantities of ore ground appear to have been stoped away from the mine and at a profit; whilst very little new ground in length of the lode has been opened up to look for fresh deposits of ore. Further sinking, as below the junction, would no doubt find the lode consolidated and more productive; but, unless with ample capital to carry out first the points I have mentioned, I would not recommend it at present. The dressing floors and the machinery on surface have ample power, and all the most modern appliances for the dressing of your produce in the best and most economical way, and every thing is in perfect order. My visit has necessarily been very hurried one, but if there is any further information I can afford you I shall be happy to do so.—ABEL PAUL.

#### PRINCE PATRICK MINING COMPANY.

The half-yearly general meeting of shareholders was held at the office of the company, Seel-street, Liverpool, on July 23.

Mr. JOHN WALKER in the chair.

Mr. THOMAS HUGHES (the secretary) read the directors' report, as follows:—

The directors feel great pleasure in again meeting the shareholders at this half-yearly general meeting, and being in a position to place before them so favourable a balance-sheet, and to congratulate them on being the owners of such a valuable mine. It will be seen from the balance-sheet, which is made up to June 30 last, that all debts due by the company to that date are included, and that after paying off all liabilities there will be a balance in hand of revenue account of 1721 1/2 ss., which, with the capital at call of 7102 1/2 ss., will leave the company with a reserve of 2689 1/2 ss. After deducting from this amount the dividend declared last June, the rate of 2s. 6d. per share, the capital of the company, there will be left a balance of 981 1/2 ss. to carry to the next account. The directors trust that this statement of the financial position of the company will be satisfactory to the shareholders. The directors are further pleased to state that the mine at all ends has improved to nearly double the value it was at the last general meeting. A vast amount of permanent work has been done, such as sinking Campbell's shaft to the 170, thoroughly repairing the same to surface, opening up the levels in the 120, 140, and 160 west; also sinking Fairclough shaft to the new east and west lode, sinking a winze to the 120 east for thorough ventilation, and preparing to extend the 120, all of which work will save the company a vast amount of time and expense in opening up the new ground discovered. The directors are glad to be in the position to confirm the statement made in their last report, that they expect to increase the sales of ore, and they are happy to say that they have done so by the amount of 1092 1/2 ss.; and had it not been for the falling off in the market price of lead the increase in the returns would have been much greater. The directors expect that from the improved state of the mine they will be able to considerably increase the sales during the next six months, and thereby be in a position to declare a larger dividend. In conclusion, the directors beg to say that they in no wish to hold out prospects that may not be realised; but, judging from appearances, they can safely say that at no previous time were they so satisfied with the results as at present, and they feel justified in stating their belief that the Prince Patrick will soon rank among the best paying mines in Wales.

The captain's report was read, as follows:—

I beg to state that we have progressed remarkably well in the last half-year's working at all points in the mine, and have now completed Campbell's shaft to the 170, and have started two new levels east and west of the said shaft upon the well-known Pant lode, which is a fine powerful lode, and is spotted thickly all through with lead ore in a most congenial gangue of a strong lode, and I have no doubt whatever that good results will come of these new drivings as soon as sufficient work is obtained. The production of lead ore from the mine has been fairly estimated just at present. The 140 west is yielding good dressing stuff, and appears very likely to further improve in value for ore as we gain ground westward away from the influence of the cross-course. The stopes above this level is maintaining its usual yield of ore, worth 1 1/2 ton per fathom. The 120 east will now be pushed on with all possible dispatch, as the winze from the 100 is holed through for ventilation, so that a good length can be driven without any inconvenience. The said winze has, moreover, proved that the ore ground is ahead of the present end. A stopes on the 120 east will also be opened up. The 100, driving south-west, on the great lode, is not quite equal in value for mineral as reported in my last advice, but it is only a temporary variation, such as we have experienced in it several times, and in all other veins as well. The two stopes above this level, working north east and south-west, are as rich as ever, and are each worth fully 4 tons per fathom, leaving many fathoms of ore to the sides and floors in reserve.—Fairclough Shaft: The newly-discovered east and west lode in this shaft is maintaining its strength and regularity of produce as we sink, of good dressing stuff, with occasional fine specimens of pure potter's ore. A cross-cut from the 120 to the 140 west, and Campbell's shaft to the 170, will be pushed on to a depth of 50 fms. from surface; the total length of this cross-cut will be under 25 fms. The 40 tons of ore sold on the 9th inst., and also the 5 tons of round ore, at 16s. per ton, are discharged, and dressing is going on for a similar quantity next sale. All our pitwork has been re-set down to the bottom of the mine, and new bearers, &c., have been added. We have also had the engine and boiler strengthened lately, so we can now state that the whole of the machinery and the mine are in the best state of repair and working order.

The CHAIRMAN said it was a very pleasing duty for him to preside at this meeting, and be able to congratulate the shareholders on the excellent prospects of the mine. They would see by the reports which had just been read that important developments had been carried out, and that the result of this extended working was that since the last six-monthly meeting the mine had been at least doubled in value. The regular monthly sales of ore for the last six months consisted of 40 tons per month, which amount was easily prepared for market; and with an additional increase during the next six months, and which they can now calculate upon, the mine would be in a position to pay much larger dividends. He considered that the thanks of the shareholders were due to Mr. T. Hughes for his successful efforts in bringing the mine into its present satisfactory position. He would now move the accounts and balance-sheet, together with the reports as presented, be received and passed.

The proposition was seconded by Mr. BARKER, and carried unanimously. Several shareholders then put questions to the captain relative to the state of the mine, machinery, &c., all of which were answered to the entire satisfaction of the meeting.—Mr. BARKER then proposed a vote of thanks to the managing director, Mr. T. Hughes, and to Capt. John Lloyd, which was carried unanimously.

A vote of thanks to the Chairman terminated the proceedings.

#### AUSTRALIAN MINING COMPANY.

The annual general meeting of shareholders was held at the London Tavern, Bishopsgate-street, on Monday.

Mr. HENRY COLLIER in the chair.

The SECRETARY read the notice convening the meeting and the minutes of the preceding one, which were confirmed, and the directors' report, of which an abstract is subjoined, was submitted:—

The directors report that at Tungkill (Special Survey of 20,000 acres) the quantity of grain reaped this year by the company's tenants has not been so large as anticipated; the prices obtained, however, were satisfactory. The arrears of rent stated in last report were 1074 1/2 ss. 2d.; less allowance for scrub, thistles, &c., 107 1/2 ss. 4d., equal to 966 1/2 ss. 10d.; to which must be added the rent to March 25, 1874, including Palmer township, of 2603 1/2 ss. 4d., making 3510 1/2 ss. 2d., whilst the amount received by Mr. Davenport to May 20, 1874, was 2776 1/2 ss. 11s. 1d.—so that the arrears on June 15, 1874, were reduced to 733 1/2 ss. 14s. 1d. By the terms of the existing agreement the tenants are to pay an increase of 25 per cent. from Lady-day next; and the directors have been in frequent communication with Mr. Davenport, the company's agent in the colony, on this subject, the result is that it would not be politic to insist on the increase, except in some few special cases. Mr. Davenport writes, under date May 20 last:—"I am endeavouring to discriminate on the different qualifications of the blocks which a few years operations have divulged in order to adjust a new series of rental. First,—It is useless in the face of Government enticement. The east end, credit, and purchase of the fee of the land, and to attempt to strain rents. It is not a question whether your tenant farms properly, so as to raise such annual return from the land, as its powers under good management might admit of, but rather to regulate rent in relation only to those easy efforts the tenants will use in raising crops. If we press for exertions to be unwillingly employed or declined in toto, the farms will be deserted, and we go back to grazing rents; however, I should expect, as the tenants supply themselves with a sufficient stock of farming materials, horses, ploughs, reaping machines, &c., of their own, and their fencings more numerous and complete, they will be able to pay their existing rate of rents more faithfully and easily. I think we must give up all idea of raising the rents as a whole; I purpose adjusting the rates, raising slightly some where experience has shown that the land is better than we first thought, and reducing some where the contrary has been proved. This work I have not yet completed, for it takes time and enquiry; but I think we cannot look for any material increase in the aggregate sum; and, in doing this, I would suggest that the rates adopted in modification of the existing ones should not be fixed over so long a period as a seven years term. I prefer to fix a change for four or five years, leaving the existing rates unchanged beyond that period. This will give the chance of then acting as, perhaps, more favourable times might allow. The changes may diminish our number of tenants farming; but, perhaps, that may be beneficial, because a combination of grazing (sheep especially), with grain growing, is necessary to prevent the utter exhaustion of the continued wheat growth, and one cannot see how the land can be kept in order otherwise. If thus we can (in a few years) retain the land return at something like its present sum, which will be, perhaps, all we can look for; but, meantime, for ultimate selling value, if not rental, the clearance of tim-

ber and stone and the ploughing of the surface should prepare the land for a greater value for pasture, if not for arable purposes, and so promise a better selling value to the company desire to realise." At the date of last advice early rains had fallen, and the tenants were busy ploughing and sowing for next season's grain crop.

At Palmer township three months' lease had been sold—one for 65s., one for 80s., and one 50s., the last to be paid for by instalments in three years, with interest. The Government has established a police station at Palmer, and the high road from Adelaide to the River Murray, at Mannum, is complete, running through the township. The Bank of South Australia has opened a branch at Palmer. The want of a supply of water sufficient for the requirements of the township has led to a proposal that water should be conveyed from the springs on the company's property about three-quarters of a mile distant to a reservoir to be formed within the township, and Mr. Davenport has offered, on behalf of the company, a donation of 25s. towards this desirable object. The cost will be probably 2000, or 3000.

The past year has been one of almost total cessation from mining operations at the Ready Creek and North Tungkill Mines. Scarcity of labour is the principal cause, but lately a few tributers have returned with their families.—Charlton is let at the same rental of 2000, per annum, to Dec. 1 next, to the same tenants. Land in this neighbourhood is being gradually taken for farming, and the townships of Laura and Gladstone, distant respectively 7 and 14 miles from Charlton, have been formed. A railway is proposed between Port Pirie and Gladstone. Port Augusta is let for five years from Oct. 1, 1873, at 10s. per annum.

The cash account shows a balance in hand in London, on June 13 last, of the sum of 621 1/2 ss. 6d., when remittances have been received from Mr. Davenport amounting to 2210 1/2 ss., equal to 2831 1/2 ss. 6d. The balance sheet shows the amount of unpaid dividends 4300 1/2 ss. On Aug. 1 the directors propose to pay a dividend of 2s. per share.

The CHAIRMAN explained that the reason he occupied the chair was that Col. Palmer had met with an accident, which prevented his attendance. The directors' report having been already in the hands of the shareholders, they were, no doubt, acquainted with its contents, and he was quite ready to give them any additional information in his power. He moved that the report and accounts be received and adopted.—Mr. F. COLLIER seconded the motion.

A SHAREHOLDER thought the hope was held out at the last meeting that the present dividend would be 2s. 6d. The funds in hand seemed large—he thought about 10000, after payment of 2s. dividend—and he would like to know whether the larger amount could not be distributed?

Mr. F. COLLIER said that there was nothing in the last report which made any allusion to an increase of dividend, and he hoped none of the directors were inclined enough to promise it verbally; but, going to their present position, it was not correct to suppose that they would have 10000, in hand after payment of the dividend. They had 28300, on June 30, and this had been reduced by subsequent payments to 2652 1/2 ss., against which they had unpaid dividends amounting to 4300 1/2 ss. The present dividend of 2s. would absorb 1831 1/2 ss.; they had, therefore, only 3851 1/2 ss. surplus. A dividend of 6d. per share would require 4500 1/2 ss., so that, of course, a dividend of 2s. 6d. could not be paid.

The report and accounts were then unanimously adopted: Messrs. Cutbush and Wotton were re-elected directors; thirty guineas was voted to the auditors for past services; Messrs. Grove, Franklin, and Ehrensperger were re-appointed auditors; and thanks were voted to Mr. Davenport, the manager in the colony.

A SHAREHOLDER enquired whether the plots of land sold were freehold or leasehold, and, if not the latter, whether it would not be preferable to sell on lease?

Mr. F. COLLIER said that in all cases the freehold was sold. The land on building leases was unknown in the colony. No one would build there, and improve the value of the remainder.

Thanks were then voted to the Chairman, and the meeting separated.

#### BLINMAN CONSOLIDATED COPPER MINING COMPANY OF SOUTH AUSTRALIA.

An extraordinary general meeting of shareholders was held at the offices, Cannon-street, on Thursday, for the purpose of considering the expediency of passing a resolution that by reason of its inability to meet its liabilities the company should be wound-up.

Mr. H. HILLS in the chair.

Mr. R. LOCK (the secretary) read the notice convening the meeting.

The CHAIRMAN said as the meeting had been convened for the special purpose of submitting the resolution embodied in the notice, he then proposed the resolution that the company be wound-up voluntarily.

Mr. ATTELL thought it would have been more decent if the shareholders had had placed before them a financial statement, so as they could judge of the actual position of affairs.

Mr. C. S. HILL confessed his disappointment at the bald way in which the result had been put before the shareholders.

The CHAIRMAN said the company were totally without money, which shareholders must know from the various circulars recently forwarded to them. The result had been that the bankers in Australia had seized the property, and all the now remained reverted to the bondholders' trustees.

Mr. PEARL said that Mr. Martin had over and over again assured him it was good concern, and that it would be a success, but now they were invited to sign their death warrant.

The CHAIRMAN, in reply to a question, stated that 50000. was subscribed for preference shares, of which 30000. was paid to the bank on account of the mortgage.

Mr. RANSFORD (a director) said that before Mr. Martin went to the colony the board considered that the bank were amply secured, holding property to the value of 40000., whereas the advance was only 20000.

Mr. MARTIN said that he forwarded several telegrams to the board in London, announcing the fact, but received no reply.

Mr. ROWSELL understood at the last meeting that 10,0000. would pay the company in a proper position, and those who had subscribed upon the condition that more should be expended unless the whole were subscribed, had just cause of complaint against the directors.—Mr. RANSFORD said that the old directors, including the Chairman, would do nothing until the 10,0000. had been subscribed, but the new directors were for going on.—Mr. DAVIS (a director) said that Mr. Martin had over-ruled him, because he undertook to put the mine in proper working order, and erect the dressing machinery to dress the ore on the mine. Had it not been for that not one penny piece of that 50000. would ever have been expended.

Mr. MARTIN said he must flatly contradict Mr. DAVIS. When Mr. Martin went out to the colony he agreed to do his best; 10,0000. he stated, would be required, and when he arrived he found the bank was pressing, and had been so for some time. There was something like 18000. due to the bank over and above the mortgage. He paid off in cash with his own money 10000., and telegraphed to England, informing the directors what should be done. He had no reply to his telegram; when the 10000. had been exhausted the bank compelled him to give his own personal guarantee for 15000., which he did. He went to the mines, and remained there some months, doing all he could, without money being sent to him. He almost managed to induce competent parties to undertake the erection of the dressing machinery, and he was prepared to do so on his own responsibility, but he could get no reply from the directors, and he knew the property was mortgaged, and that the interest on the debentures was not being paid. When the 15000. had been exhausted he received another intimation from the bank that the account must be closed. He induced the manager to put it off for another month, but the day before the mail started in March he ascertained the sheriff had gone to the mine to take possession. He offered to give the bank his guarantee, and make himself responsible for the company's liabilities, and he had no security; he asked them to do that in order to get an opportunity of telegraphing to London, which he did, but no reply ever came.

The CHAIRMAN said a telegram was sent informing Mr. Martin of the result of the last meeting.

Mr. MARTIN said that was no reply to his last telegram. Upon leaving the colony he left word to send another telegram, for he was not willing to do with the bank mortgage money in cash in addition to his guarantee. Had the 10,0000. been raised, 50000. could have gone for the erection of the machinery, and that would have saved the company.

Mr. PEARL held his shares on the faith of the statements of Mr. Martin, whom he believed to be an honest man; but now, at the last moment, he had allowed the company to be thrown over because he would not provide a security for 20000. upon property worth double the money advanced.

Mr. MARTIN said he could not do it by the position he held as director. He consulted the solicitor upon the matter, who advised him to have nothing to do with it; besides which, had he done so he must have found the money to put up the machinery, and while the mortgage was upon the property.

Mr. DAVIS said one great reason which induced the directors to go on with the 50000. subscribed for preference shares was that Mr. Martin induced them to believe he would take 2000 shares.

Mr. MARTIN said his statement was if 10,0000. were raised he would subscribe for 2000 shares.

The CHAIRMAN, in reply to a question, stated that the last accounts from the colony showed the liabilities exceeded the assets by 9000. He added the directors had had no fees for years.

Mr. MARTIN, in reply to a question, stated the bondholders' property was perfectly safe.—The CHAIRMAN said that a power of attorney had been sent out to take possession of the property on behalf of the bondholders.

Mr. ATTELL said that the capital of the company was 135,0000.; the mine had yielded copper to the value of 250,0000. during the last three years; 22,2500. had been subscribed on debentures and 50000. on preference shares—the whole of this without any result. Under these circumstances, what possible good could arise from a continuance of operations? The present shareholders would not subscribe one farthing towards it.

Mr. PEARL said the whole of their misfortunes had arisen from bad management, and now they had a manager whom they believed to be a good one they were asked to wind up the company without having the opportunity of trying to do something to save the property.

Mr. PATTERSON (the solicitor) reminded the meeting there were no assets, and they had to leave the premises on Aug. 20, as the directors had no means with which to pay the rent or the secretary's salary. There were no assets, except a claim for 1500, against Mr. DAVIS.

After some further discussion, an adjournment was agreed upon to Thursday.

#### THE WHITEHAVEN IRON MINES.

The annual meeting of proprietors will be held at the London Tavern, on Friday, when the report for the half-year ended June 30 will be presented:—

In the past six months considerably further progress has been made in the opening of the mines—so that on the completion of the railway, now being rapidly pushed forward, the company will be able to commence sending iron to the market in an increased quantity of ore. This the directors have every reason to believe will place the company in a dividend paying state. It is satisfactory to the directors to be able to state that, notwithstanding the more rapid extension of the works, and the consequent greater expenditure in opening the mines, all expenditure, including that of the London office—except upon the railway—has been met out of the reserves of ore from 85,125 tons to about 100,000 tons. Owing to contracts made during the high prices which prevailed last year, the company has realised a higher price than before for their iron ore during the past six months—an average of 11s. 3d. per ton, as against 11s. 8d. for the prior half-year, and 11s. 3d. for the corresponding six months in 1873. These contracts are still unexpired, and



"Elements of Metallurgy: a Practical Treatise on the Art of Extracting Metals from their Ores." By J. ARTHUR PHILLIPS, M. Inst. C.E., F.G.S., F.C.S., &c., ancien Elève de l'Ecole des Mines de Paris. London: Charles Griffin and Co., Stationers' Hall-court.



of Australia. During the years 1835 to 1838, the annual production of tin in Cornwall and Devon amounted to between 4000 and 5000 tons; since that time it has steadily increased, until in 1871 it amounted to 16,898 tons of black tin, equivalent to 11,320 tons of metal; during the same year the imports into the United Kingdom were about 9000 tons, and the exports about the same quantity. It seems not unlikely that the production of tin ore in New South Wales will reach, if not surpass, that of all the old tin mining countries combined. The quantity of tin lying on the surface in Australia has been estimated at 25 times the annual produce of this metal in Cornwall. The present total annual production of tin in the world may be roughly estimated at between 25,000 and 28,000 tons.

There is a good description of Oxlard's process for separating wolfram from tin, and excellent drawings of tin smelting furnaces. The metallurgy of antimony, arsenic, zinc (illustrated with drawings of English, Belgian, and Silesian furnaces), mercury, bismuth, and lead are in turn treated of, plans and sections of some very successful forms of lead furnaces in use at Courron adding much to the value of the latter. Pattinson's and Parkes's processes for the desilvering of lead are fully described, and Flach's and Corduri's processes for the desilvering of lead are also referred to. The various methods of treating silver ores are next explained, and diagrams of the most recent and approved furnaces and apparatus are given; the last metals treated of being gold and platinum, the metallurgy of which is described in the most complete and comprehensive manner, whilst a copious index renders the book very complete. There is certainly no metallurgical treatise in the language calculated to prove of such general utility to the student really seeking sound practical information upon the subject, and certainly none which gives greater evidence of the extensive metallurgical knowledge of its author.

#### EARTHWORK MENSURATION.

There is, probably, nothing to which the civil engineer has more frequently to trace annoying errors in his aggregate estimates than to his many trifling mistakes in calculating the amount of earthwork involved in overcoming the many natural obstacles with which he has to deal, and the tedious nature of the processes hitherto adopted for obtaining the desired results has certainly been some excuse for inaccuracy. Recognising these facts, Major Howard, C.E., of Richmond, Va., U.S., has prepared a very valuable treatise, the object of which is to enable the practical engineer to calculate the true prismatic contents of a mass of earth to be removed with the same facility as averaging end areas, and that this object has been attained is acknowledged by some of the most eminent engineers who have already had the opportunity of testing the book. By the employment of only a couple of dozen pages of tables, the calculation of which has, doubtless, involved a considerable amount of labour, Major Howard is enabled to present a new and systematic method of finding the prismatic contents of earthwork by the use of rules readily understood, and easy of application by anyone accustomed to the ordinary business of an engineer's office, the method possessing, moreover, the great advantage that by giving accurate corrections for the familiar approximations in general use the calculator has, as the author very truly remarks, the element of error constantly before him, and must speedily learn by practice, if not by theory, the cases in which such corrections become important.

As all works of this class are valuable or worthless according as they are reliable or otherwise, the first enquiry which naturally suggests itself is whether the author is scientifically correct in the principles which he recommends for adoption, and that there may remain no question upon this point Major Howard devotes the first 20 pages of his book to the strictly mathematical investigation of those principles in such a manner as to show the derivation of the formulae to be employed in practice; whilst the second part contains the necessary instructions for obtaining the prismatic contents sought, and supplies practical rules and examples, showing the uses of the tables in simplifying computations by the formulae given, so that whether it be required to find the prismatic contents of thorough cut or fill when the road bed width and side slopes are constant between the end sections; of side-hill work, pyramids, &c., with similar end sections; or of thorough cut or fill when the end road bed widths are different; and to make the necessary correction for curvature in single width thorough cut, or in side-hill work when the transverse surface slope is regular the requisite calculation can be easily and quickly made. It is pointed out that the rules for computation of cubic contents are based on the condition that the transverse service lines of the end sections shall be sensibly similar, but it is very properly pointed out that by combination they will cover all cases to which the method of "roots and squares," and of "equivalent level heights," can be correctly applied, and that the practical limit of their application may be indefinitely extended by increasing the proximity of the cross sections in rough ground.

With regard to the tables, Major Howard states that he has calculated them himself, and as the system used was that of continued additions with special tests at intervals, he believes they will be found absolutely correct within the purposed limits, whether the last figure of any amount given be intended to express the nearest whole number or the nearest decimal; and judging from the results obtained with the rules and tables applied to three or four examples taken indiscriminately, with a view to test them, we do not hesitate to say that they are quite reliable. The work will prove of almost inestimable value to practical men from the vast saving of time that will be effected by its use when estimates of as near as may be perfect accuracy are desirable, and for this reason it is likely to find great favour with the engineering profession.

"Earthwork Mensuration, on the Basis of the Prismatic Formula: Containing a Simple and Labour-saving Method of Obtaining Prismatic Contents Directly from End Areas." By CONRAD R. HOWARD, C.E. New York: D. Van Nostrand, Murray and Warren Streets.

**SOCIETY OF ENGINEERS.**—The new volume of "Transactions" of this Society just issued (through Messrs. Spott, of Charing Cross) contains six really valuable papers.—"Examples of Recent Practice in American Locomotive Engineering," by Mr. Vaughan Pendred; "On State Railways and Railway Amalgamation," by Mr. George Spencer; "On Electric Telegraph Instruments and Electrical," by E. G. Bartholomew; "On the Construction and Use of the New Works," by Mr. Henry Dwyer; and "On Continuous Railway Brakes," by Mr. William H. Fox. The character of the papers affords ample evidence of the practical and useful nature of the society, which we are glad to learn is constantly increasing in prosperity, and the manner in which the "Transactions" are edited reflect great credit upon Mr. P. F. Nurse, the secretary, under whose care they are published.

**GENERAL ADVERTISING.**—The practice of general advertising with special reference to public companies and public investments is discussed in a pamphlet just issued by Messrs. Pease, Lever, and Co., by way of introducing themselves as advertisement agents. It is shown that whilst at a moderate estimate it costs 4s. 1s. 8d. per thousand, or 612s. 10s., to print, address, fold, and post 150,000 prospectuses, an advertisement of 150 lines in one of the leading London newspapers can be inserted, and thus obtain circulation in 150,000 houses, for 13s. 14s.; and it is pointed out that provincial advertising is still cheaper. The firm are undertaking to address and send out prospectuses. Such agencies as these are in many cases extremely useful.

**THE LATE DR. GEORGE SMITH.**—A handsome yet well-deserved little tribute—"Life's Battle Won," by the author of the "Gold Fields of California," to the memory of George Smith, LL.D., of Treva, Camborne (of Messrs. Bickford, Smith, and Co., the well-known safety-fuse manufacturers), has just been published by Mr. J. S. Doidge, of Redruth, and may be profitably read by all classes, since it would be difficult to write a biography containing more conclusive evidence of what may be done by steady and honest perseverance towards the acquisition of a high social position, as well as a good rank in the world of letters. Dr. Smith was the son of a carpenter, and we are told that up to the age of eight years he picked up what little learning he could at the various dame-schools in the district, and that from eight to eleven he was instructed in the daytime at a Lancastrian free school in Plymouth, whilst out of school hours a son of the builder with whom his father worked taught him the rudiments of geometry and algebra. He was subsequently employed about farm work until his seventeenth year, when he was apprenticed to a carpenter. At 21 he became a Wesleyan Methodist. At 27 he married, and a few years afterwards—his father-in-law (Mr. William Bickford) having invented the miners' safety-fuse, he was enabled, by throwing all his energies into the business, to amass considerable wealth. In the year 1840, and subsequently, he published many volumes of theological works, and obtained from the New York University the degree of LL.D. Dr. Smith was for many years the Chairman of the Cornwall Railway, and upon his retirement, ten years since, he was presented with a testimonial from more than 500 subscribers, consisting of a candelabrum and pair of ewer-pieces, weighing nearly 700 ozs., and costing about 400 guineas. He died a country gentleman and a county magistrate, beloved and respected by all around him, regardless of the religious denominations to which they belonged; his death, although he was a dissenter, being made the subject of a beautiful and impressive sermon by the minister of the Established Church in the neighbourhood on the Sunday following his burial. The pamphlet should be very extensively read.—London Agent: W. Kent and Co., 23, Paternoster-row.

**STAMPING MILL AND ROASTING ORES.**—Messrs. P. J. MITCHELL, Salt Lake City, and J. E. Gay, New York, have patented an improved stamping mill and furnace for roasting ores. This stamp is made in any of the known forms used in stamp mills. In the shaft are toothed racks, between which is an adjustable clutch, which receives a cam secured upon a revolving shaft, by means of which the power and motion are communicated. The form of the cam and contrivance of the clutch are such that, no matter how much or little the stem may fall, the fall of the clutch will always be the same, so that if at one blow the stamp is checked by a large piece of ore, it will be raised at the next operation the height of a full stroke. The object is to secure uniform blows from the stamp upon the material to be crushed. The same inventor has also devised and similarly assigned a furnace for roasting ores. It is an oven of rectangular structure, of fire-proof material, on the side walls of which are arranged hoppers of iron, with a movable slide, to be opened or closed by means of a shaft and chain. The materials for calcination are placed within the hoppers, where they remain a few hours, when they are dropped through the action of the sliding doors upon the calcining floor, which

is constructed of cast-iron plates supported upon brick flues, through which the heat is conducted from the furnaces and returned over the working floor through a flue, receiving an additional supply of heat. The gases are carried on by the draught of the chimney through the flues and condensers, the latter consisting of a showering apparatus, through which water is let fall, by which a portion of the escaping sulphur, arsenic, &c., are deposited in the pans, and removed at pleasure.

#### FOREIGN MINING AND METALLURGY.

The Belgian iron trade still displays a want of activity. Enquiries do not wholly make default on the part of customers, who see the period approaching when they will be compelled to lay in additional supplies, but orders calculated to assure the future still fail to present themselves. There is no serious anticipation upon these circumstances of an immediate advance in prices of iron or pig; this is, perhaps, attributable to some extent to the fact that the proprietors of many works seem disposed to go on without any profits rather than to remain unemployed. This latter policy is indicated in the prices obtained at adjudications, and also in transactions proposed from hand to hand. A recent adjudication of tyres for carriages and locomotives on the Belgian State railways showed that German ironmasters will not be able to sustain much longer a serious competition with Belgian firms. Thus, the accepted tenders of the John Cockerill Company for steel tyres for carriages and for tyres and for locomotives of MM. Gernaert and Co. were much lower than those delivered by German works. An adjudication will take place at Brussels on the 19th prox. for Vignoles iron and steel rails; this adjudication will enable the true condition of Belgian metallurgical industry to be more fully and correctly appreciated. Prices of iron and pig have undergone scarcely any variation in Belgium during the last few days.

Copper has been rather weak upon the Marseilles market. At Paris also quotations for copper have exhibited some feebleness. Chilean bars has made 82 $\frac{1}{2}$ ; ditto ordinary descriptions, 79 $\frac{1}{2}$  4s.; ditto in ingots, 86 $\frac{1}{2}$ ; English tough cake, 86 $\frac{1}{2}$ ; and pure Corocoro minerals, 81 $\frac{1}{2}$  per ton. The tone of the German copper markets has not experienced any material change. There has been no great amount of business in tin at Paris; prices may be said to have remained without variation. Banca, delivered at Havre or Paris, has made 104 $\frac{1}{2}$ ; Straits ditto, 102 $\frac{1}{2}$ ; and English, delivered at Havre or Rouen, 101 $\frac{1}{2}$  per ton. The Marseilles tin market has been extremely weak. At Rotterdam tin has remained, upon the whole, stationary; disposable Banca has been maintained at 57 $\frac{1}{2}$  fls. to 57 $\frac{3}{4}$  fls.; for deliveries in September the rate has been 56 $\frac{1}{2}$  fls. As regards Billiton, some transactions have been noted at 56 fls. In Germany there have been some small sales to meet the requirements of local consumption, but there cannot be said to be any animation in affairs. At Paris lead has maintained a good tone; French lead, delivered at Paris, has made 21 $\frac{1}{2}$  8s.; Spanish, delivered at Havre, 21 $\frac{1}{2}$  4s.; and English ditto, 21 $\frac{1}{2}$  4s. per ton. At Marseilles lead has also ruled firm. Transactions have not been very freely entered into upon the German lead markets: at the same time, the demand remains good, and prices have been well sustained. The Paris zinc market has been very quiet and undecided. Silesian zinc, delivered at Havre, has made 25 $\frac{1}{2}$ ; other good marks, delivered at Havre, have also made 25 $\frac{1}{2}$  per ton. The German zinc markets have exhibited no change.

There has been comparatively little business passing in the French coal trade, and prices have not varied. In this respect the state of affairs is the same at Paris as in the Nord and in the Pas-de-Calais, and it appears now tolerably certain that an advance cannot be anticipated in prices before the winter. The market of the Loire has been sustained with some difficulty. Coalowners have, nevertheless, nothing to complain of, since stocks are small and the present extraction scarcely corresponds to the current requirements of consumption; it is even feared that the winter will open without any stocks on hand, and that it will then be scarcely possible to provide for current wants. Any such apprehensions as these are, however, exaggerated, as on any stimulus being given to business the production of coal would soon grow as rapidly as the demand. Some attention is being devoted to the question of the proposed great submarine tunnel between England and France. A commission appointed to consider the subject has reported favourably upon the scheme; the feasibility of such a tunnel appears to be admitted, but the question, of course, which has to be considered is whether it would be possible to secure an adequate remuneration for the capital engaged in the enterprise. Coalowners in the Nord and the Pas-de-Calais are looking very far ahead; they are even debating the effects which such a tunnel would exert upon their properties by pouring increased supplies of English coal into the North of France.

A decided amelioration is considered to have been established in the French iron trade. This is the report made semi-officially upon the subject, but hitherto, it must be observed, there has been no real increase of activity in affairs. Some firms in the Nord have attempted an advance of 8s. per ton in merchants' iron, but a sufficient number of transactions has not been entered into upon the new basis to render it possible to affirm that the public has accepted the rise. In any case, rolled iron from coke-made pig has brought 8 $\frac{1}{2}$  16s. per ton in the Nord and the Haute-Marne, and refining pig 4 $\frac{1}{2}$  8s. per ton at Paris. Business has been done in merchants' iron at 9 $\frac{1}{2}$  4s. per ton, but attempts are being made to carry the prices to 9 $\frac{1}{2}$  8s. per ton. Some experimental efforts made in this direction have not been altogether without success. In the basin of the Loire there are still the same contradictions; while some firms complain of an absolute want of work, others note with pleasure the frequent receipt of new orders. Some firmness is noted in the Loire in the price of fine qualities of iron and Bessemer steel. The considerable extent of new railway conceded in France must sooner or later involve important orders for iron, which will go in all probability to French works.

With the exception of some privileged collieries, the production of which is regularly disposed of, the general situation leaves little to be desired. Orders have arrived less freely for some time past, and prices begin to want firmness; indeed, the market generally exhibits some heaviness. Some colliery owners in the centre of Belgium, as well as in the Charleroi basin, propose to shortly advance the price of their products. We believe that this measure will meet with an active resistance on the part of consumers, and that a similar policy will not be followed in the Liège basin, either by the collieries of the valleys of the Ruhr or the Sarre. The production, which has been for some time diminished by the great works of reparation and appropriation which have been undertaken on all sides, will soon resume its normal course, and fair stocks will probably be accumulated in the autumn months. Prices are for the present, to some extent, nominal. Ordinary coke continues neglected in Belgium, at 16s. 10d. per ton, and at 20s. 10d. to 22s. 6d. per ton for coke from washed coal.

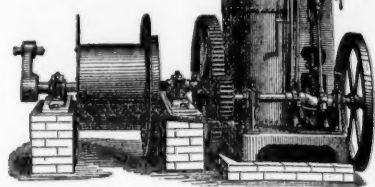
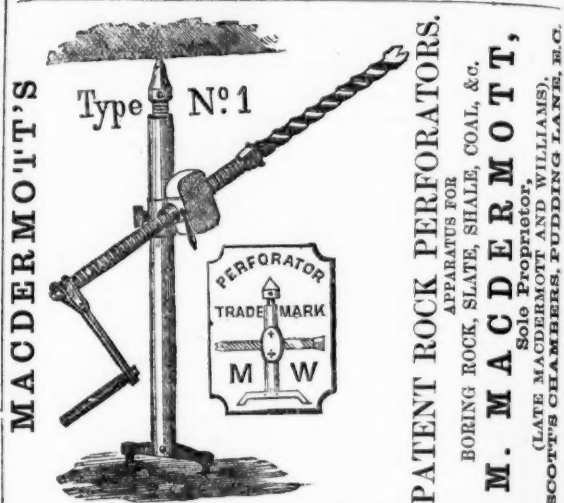
**NEW SAFETY APPARATUS FOR MINES.**—Mr. E. T. HUGHES (for N. Libotte, of Gilly, Belgium) has patented an improved system and arrangements of safety apparatus, applicable to cages used in the shafts of mines and hoists. This improved safety apparatus is distinguished from all others by its simplicity and facility of construction, for it is not operated as hitherto by springs which are susceptible of being relaxed or not acting, but by the motion and weight of the cages—that is, by all its acting force, there being below the top frame of the cage a double movable frame having claws, which claw into the guides of the shaft of the mine or pit, the pressure being given by the weight of the parts, and also with additional weights and springs.

**PUDDLING IRON.**—Sir J. G. N. ALLEYNE, Bart., of Butterley Ironworks, Alfreton, has patented some improvements in apparatus for puddling iron. This invention relates to puddling furnaces of the kind having a rotating bottom of basin form, and to babbles to be used in connection therewith. The basin is formed with a double bottom, and supported on a tubular shaft. A pipe extends up this shaft conveying water to jets in the space between the two bottoms, which jets play on the under surface of the upper bottom to keep it cool, the water flowing down the tubular shaft to an outlet at the bottom. The bubble consists of a stem, with a number of times projecting down from it into the fused metal in the basin. The bubble has either a reciprocating or a rotary motion imparted to it for more effectually stirring the fused metal.

**HOLLOWAY'S OINTMENT AND PILLS—DISEASES OF THE SKIN.**—No case of the disease of the skin, be its nature what it may, has failed to be benefited by these potent remedies when properly applied. In scrofulous and scrofulous affections they are especially serviceable. Scabies and eruptions, which had resisted all other modes of treatment, and were gradually becoming worse from year to year, have been completely cured by Holloway's cooling ointment and purifying pills, which root out disease from the blood itself, leaving the constitution free from every morbid taint. In the nursery Holloway's ointment should be ever at hand: it will give immediate ease in sprains, contusions, burns, scalds, infantile eruptions, and may always safely be applied by any ordinary attendant.

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Semi-  
Portable  
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VerticalSTEAM ENGINES, FOR PIT SINKING,  
WINDING COAL, PUMPING, &c.Also COMBINED MILLS AND ENGINES for Grinding Slag, Sand,  
Mortar, &c.  
Specifications and prices on application.

This is the best hand-worked implement for colliery purposes extant. It can be carried about, set up, taken down, and worked by one man. It bores vertically upward as well as in any other direction. The rate of work is at least four times as great as by the usual methods. The hole made is straight and uniform, and, therefore, specially adapted for the use of cartridges.

Price list and description, with list of places where the Perforators are in use, on application as above.

A Special Type for Overground Work and Shaft Sinking.

#### GEOLOGICAL MINERALOGY.

**SIX ELEMENTARY LECTURES ON ROCKS AND METALLIC MINERALS.** adapted to a juvenile audience, will be given by PROFESSOR TENNANT, at his residence, 149, STRAND, W.C., August 3rd, 4th, 5th, 6th, 7th, and 8th, at Ten A.M. and Three P.M. Terms.—Half-a-guinea for the course. Prof. TENNANT will probably afterwards repeat the Elementary Lectures on Mineralogy and Geology given during last Easter and Christmas holidays.

The Lectures delivered on the subject of Geology are intended to have special reference to the important practical applications of that science to Engineering, Mining, Architecture, and Agriculture. The Granites, Syenites, Porphyries, Gneisses, Clays, &c., will be described, and the minerals peculiar to each noticed. The application of Geology to pursuits connected with Mining Operations for Coal, Iron, Copper, Tin, Silver, Gold, Mercury, Antimony, Zinc, Cobalt, &c., will be specially considered. The Student is directed how to proceed in examining a new country, to collect and record his observations, and mark his specimens, in order to render them useful to more experienced geologists at home.

In order more fully to exemplify the applications of the Science, Mr. TENNANT accompanies his Classes to various Museums in London, including the Museum of Practical Geology and the British Museum; also, in Excursions into the Country, in which the actual field work of the Geologist is explained and illustrated.

**MR. TENNANT, 149, STRAND, LONDON, W.C.,** has FOR SALE some VALUABLE and CHOICE COLLECTIONS of MINERALS, &c.:—

I.—A Collection of about 2000 MINERALS and ROCKS, with Models of Crystals, Diagrams, &c., in a painted deal Cabinet with 65 drawers and glass case on top, 9 ft. 5 in. long, 8 ft. 2 in. high, and 21 in. from back to front, removed from the Royal Military College, Woolwich. The Collection is well adapted for illustrating thirty to forty lectures on MINERALOGY and GEOLOGY.

II.—CABINET with 60 drawers, containing 2800 species of Fossils, represented by 4500 specimens, stratigraphically arranged. This Collection, with the Collection of Minerals No. I., would form an instructive Geological Museum for a nobleman or country gentleman.

III.—TWO CABINETS, each containing 30 drawers, with upwards of 2500 Minerals, Rocks and Fossils. This collection is well adapted for a first-class Educational Establishment.

IV.—FIRST-CLASS GEOLOGICAL COLLECTION OF TWO CABINETS, each measuring 9 ft. 3 in. long, 2 ft. 4 in. wide, and 3 ft. 10 in. high; each containing 45 drawers, with a glass case on the top of each cabinet, 4 ft. 11 in. high, and 15 in. from back to front. One Cabinet is filled with 2800 Minerals and Rocks, the other with 3400 Fossils, British and Foreign, stratigraphically arranged.

The Collection is carefully named, and consists of 6000 specimens, many very choice, and selected principally from the Duke of Buckingham's (Stowe sale), Marchioness of Hastings, Sir John St. Aubyn's, Mrs. Buckland, Bowerbank, Mantell, and other celebrated collections. The first Gold Nugget received from Australia and a Gold Nugget from Assam, weight 5 oz., is in the collection; also a fine series of Diamonds, illustrating crystalline form and colour, from India, Brazil, South Africa, and Australia.

Any person wishing to become practically acquainted with the interesting and important study of Mineralogy and Geology will find this a good opportunity to obtain an instructive and valuable Geological Museum, scientifically arranged, the specimens having been collected with care and at great expense during the last 35 years. Price £5000.

V.—MAHOGANY CABINET with 25 drawers, containing upwards of 1000 specimens of Minerals, Rocks, and Fossils in good condition and recently arranged. Price 150 guineas.

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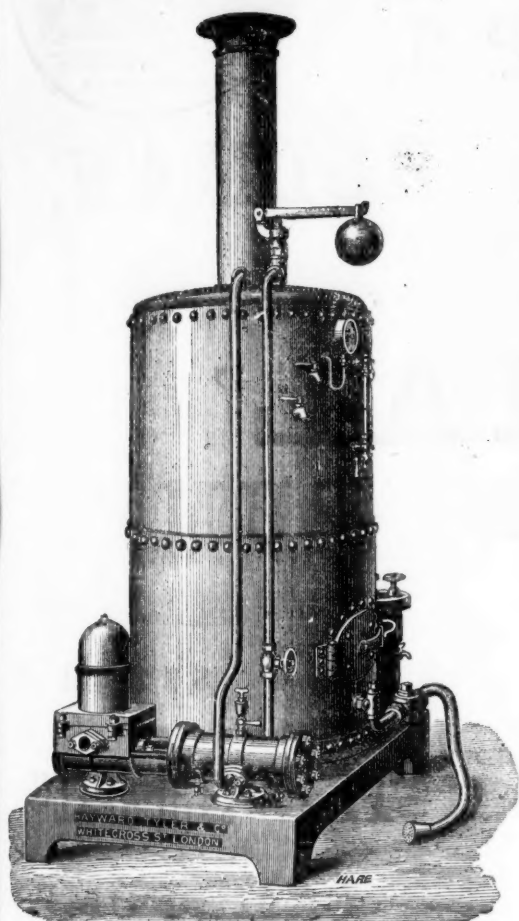
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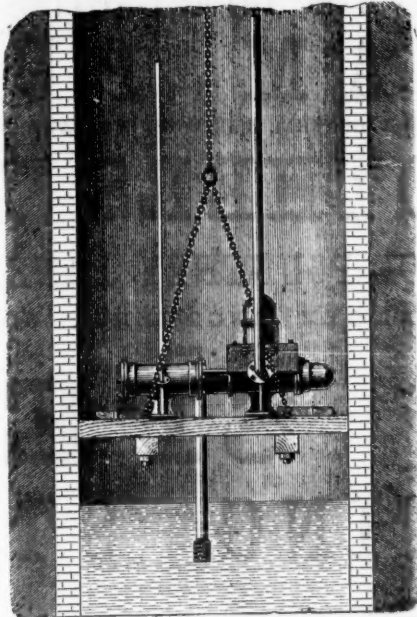
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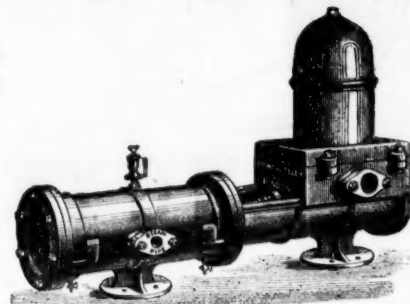
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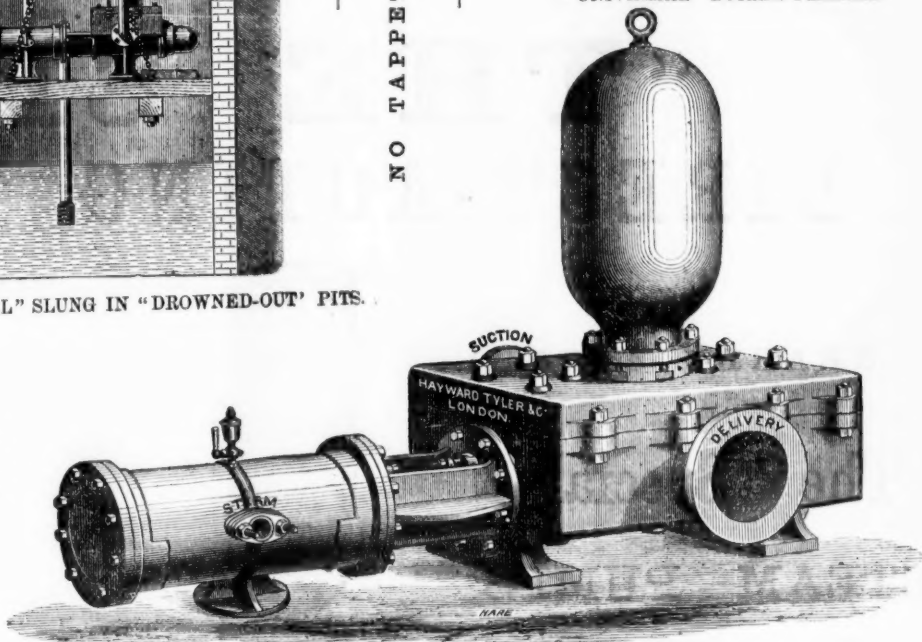
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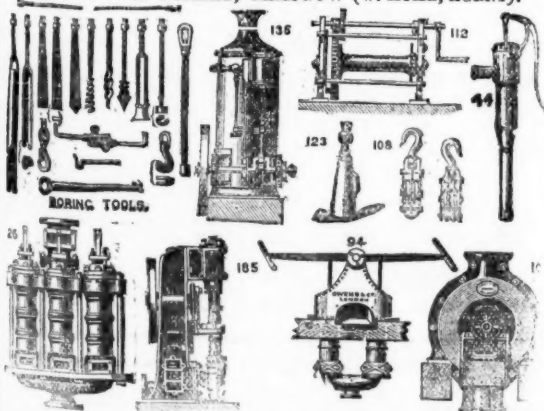
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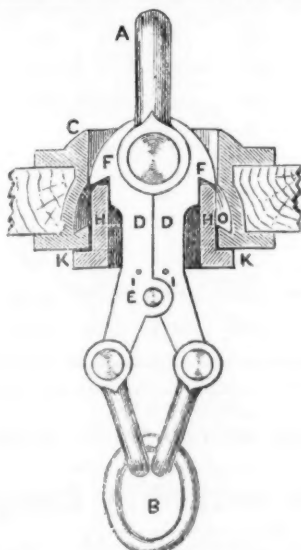
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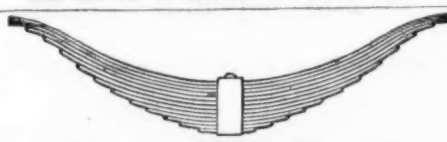
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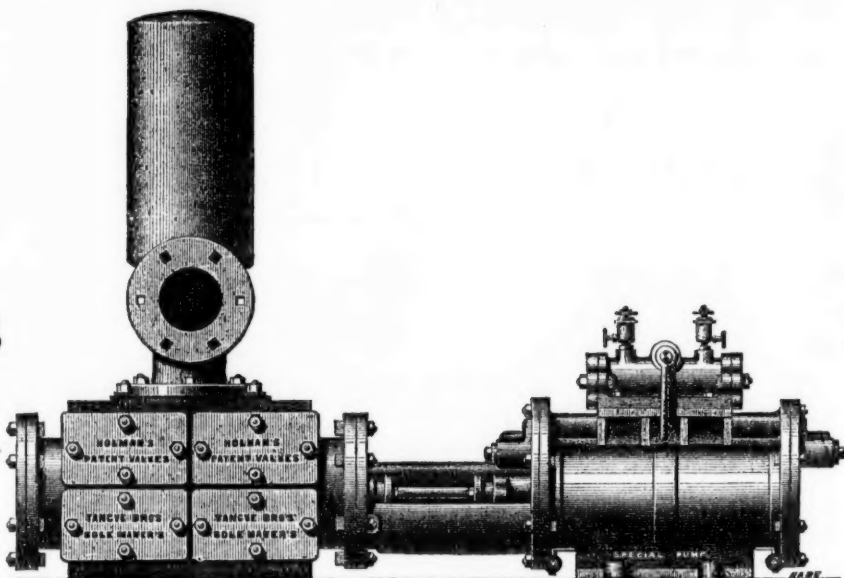
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Diameter of Water Cylinder .....	Inches	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5
Length of Stroke .....	Inches	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Gallons per hour .....		680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070
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Diameter of Water Cylinder.....	Inches	6	7	8	5	6	7	8	9	5	6	7	8	9	10	6	7	8	9
Length of Stroke.....	Inches	12	12	18	12	12	12	18	24	12	12	12	18	24	24	18	18	18	24
Gallons per hour.....		7330	9750	13,000	5070	7330	9750	13,000	16,519	5070	7330	9750	13,000	16,519	20,000	7330	9750	13,000	16,519
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Diameter of Steam Cylinder.....	Inches	12	12	14	14	14	14	14	14	16	16	16	16	16	18	18	18	18	
Diameter of Water Cylinder.....	Inches	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14	
Length of Stroke.....	Inches	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	
Gallons per hour.....		20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000	
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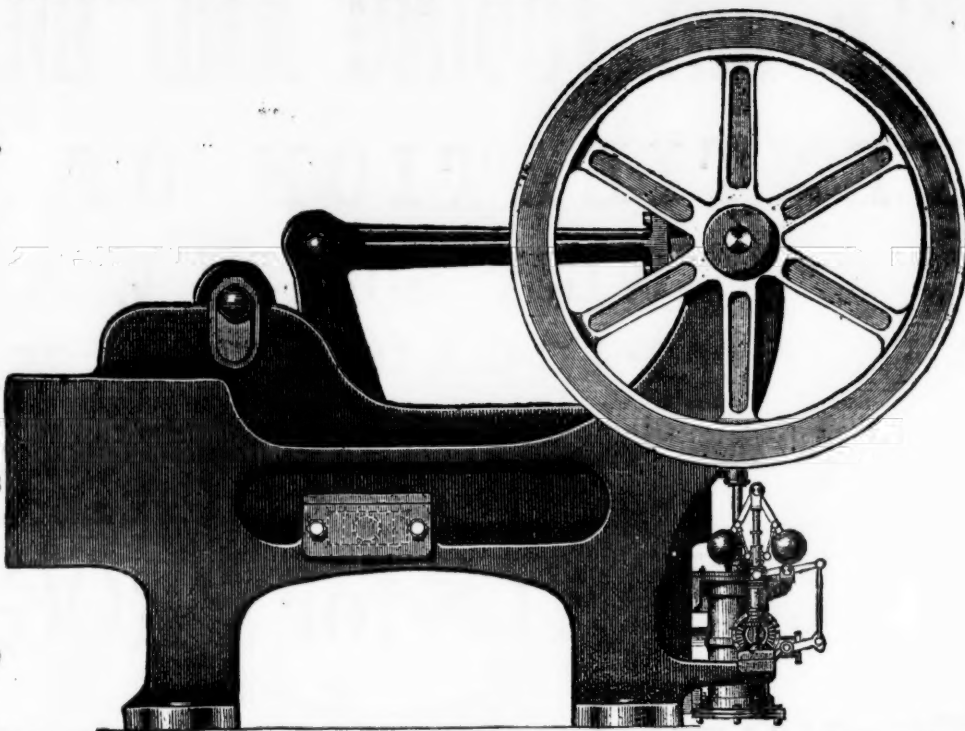
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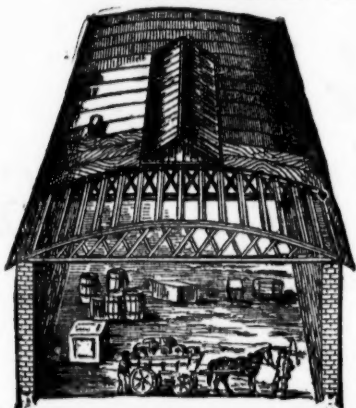
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